

VIII.—*Materials for a Flora of the Malayan Peninsula.*—By GEORGE KING, M. B., LL. D., F. R. S., C. I. E., *Superintendent of the Royal Botanic Garden, Calcutta.*

(Continued from p. 408 of Vol. LVIII of 1889.)

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ORDER IX. BIXINEÆ.

Trees or shrubs with alternate minutely stipulate or exstipulate leaves. *Flowers* regular, 1-2-sexual. *Sepals* 4 or 5 (rarely 2 to 6) imbricate, free, or connate and bursting irregularly, usually deciduous. *Petals* 4 or 5, or absent, imbricate or contorted, deciduous, often with basal scales. *Stamens* hypogynous or sub-perigynous, (united into a column in *Ryparosa*): anthers 2-celled with porous or longitudinal dehiscence. *Disc* thick, often glandular. *Ovary* free, usually 1-celled, the placentas parietal. *Styles* and *stigmas* free or united. *Fruit* dry with valvular dehiscence, the seeds along the middle of the valves; or fleshy, indehiscent. *Seeds* arillate, albumen fleshy, embryo axile straight or curved: cotyledons foliaceous. *Distrib.* Chiefly tropical: genera 30: species about 170.

Tribe I. *Bixineæ*. Petals broad, contorted, without basal scales: anthers elongate, opening by terminal pores or short slits.

Capsule with parietal placentas, 2-valved,
softly muricate 1. *Bixa*.

Tribe II. *Flacourtiæ*. Petals small and imbricate, or absent. Anthers short, opening by slits.

Flowers hermaphrodite: petals 4 to 6.

Stamens numerous 2. *Scolopia*.

„ 5 or 6 3. *Erythrospermum*.

Flowers dioecious: petals 0.

Ovary 2 to 8 celled 4. *Flacourtia*.

Tribe III. *Pangieæ*. Flowers dioecious, petals with an adnate basal scale or appendage: fruit large, indehiscent.

Sepals free.

Sepals 5, imbricate; Petals 5. Stamens

5 to 8: Stigmas 3 to 6 5. *Hydnocarpus*.

Sepals 4. Petals 8, in 2 rows; Stamens

20 to 30, Stigma 1 6. *Taraktogonos*.

Sepals combined into a cup, its mouth entire at first, but irregularly toothed on expansion.

Flowers large : stamens numerous, free 7. *Pangium*.

Flowers small: stamens united in a column bearing 5 anthers ... 8. *Ryparosa*.

1. BIXA, Linn.

A tree. *Leaves* simple; stipules minute. *Flowers* in terminal panicles, 2-sexual. *Sepals* 5, imbricate, deciduous. *Petals* 5, contorted in bud. *Anthers* opening by 2 terminal pores. *Ovary* 1-celled; style slender, curved, stigma notched; ovules many, on 2 parietal placentas. *Capsule* loculicidally 2-valved, placentas on the valves. *Seeds* many, funicle thick, testa pulpy; albumen fleshy; embryo large, cotyledons flat.

1. B. ORELLANA, Linn. A small tree. *Leaves* cordate, acuminate, glabrous; length 5 to 7 in., breadth 3 to 5 in., petiole 1·5 to 2·5. *Flowers* in short terminal branched cymes, 2 in. in diam., purple or white. *Capsule* compressed-ovoid, softly prickly, 1·5 in. long; seeds covered with coloured pulp. Bl. Bijdr. 55. Roxb. Fl. Ind. II, 31. Miq. Fl. Ind. Bat. I, Pt. 2, p. 107. Hook. fil. Fl. Br. Ind. I, 190.

Cultivated widely in the tropics on account of the dye (Arnatto) yielded by the testa of its seeds.

2. SCOLOPIA, Schreber.

Trees, spinous in India, spines often compound. *Leaves* alternate, entire; stipules minute or 0. *Flowers* small, racemed, axillary, 2-sexual. *Sepals* 4-6, slightly imbricate in bud. *Petals* 4-6, subsimilar, imbricate in bud. *Stamens* many with a row of glands outside them; anthers ovoid, opening by slits, connective produced into a terminal appendage. *Ovary* 1-celled; style erect, stigma entire or lobed; ovules few, on 3 or 4 parietal placentas. *Berry* 2-4-seeded. *Seeds* with long funicles, testa hard; cotyledons foliaceous.—Distrib. Species about 15; Australian, Asiatic, and African.

S. RHINANTHERA, Clos. in Ann. Sc. Nat. Ser. IV, Vol. 8, p. 252. A tree; young branches puberulous. *Leaves* sub-coriaceous, ovate-lanceolate to lanceolate, shortly acuminate, obscurely and minutely glandular-toothed, the base usually rounded, glabrous, shining; nerves about 7 pairs, faint; length 3·5 to 5 in.; breadth 1·75 in. to 2·5; petiole biglandular at the apex, '35 long. *Racemes* axillary and terminal, pubescent, bracteolate, 3-4 in., long. *Flowers* on tomentose bracteolate pedicels. *Sepals* 4, ovate-lanceolate, tomentose externally. *Petals* 4, larger than the sepals, rotund,

tomentose on edges and along midrib. *Stamens* indefinite, connective glabrous. *Ovary* cylindric. *Stigma* hemispheric. *Fruit* pisiform, 2-6 seeded. Hook fil. Fl. Br. Ind. I, 190; Miquel Fl. Ind. Bat. I, pt. 2, 107. *Phoberos rhinanthera*, Benn. Pl. Jav. Rar. 187, t. 39. *P. macrophylla*, W. & A. Prodr. 30. *Flacourtia inermis*, Wall. Cat. 6673 G, H, only.

Malacca, Griffith; Penang, Curtis. Distrib. Java, Borneo.

2. *S. ROXBURGHII*, Clos. in Ann. Sc. Nat. Ser. IV, Vol. 8, 250. A glabrous shrub or small tree with spiny stem. *Leaves* sub-coriaceous, shining above, ovate, ovate-lanceolate to oblong-lanceolate, shortly acuminate, sub-entire or faintly and remotely crenate; the base rounded or slightly narrowed, 3 to 5-nerved; lateral nerves about 3 pairs, bold; length 4.5 to 6.5 in., breadth 1.75 to 3.5 in.; petiole biglandular at the apex, .35 in. long. *Racemes* pubescent, axillary, about 1 in. long, 2-6-flowered, bracteolate. *Flowers* on tomentose pedicels. *Sepals and petals* 5 or 6 each, densely tomentose externally, broadly ovate. *Stamens* indefinite, the connective ciliate. *Ovary* ovate: *style* cylindric: *stigma* 3-lobed. *Fruit* baccate, the size of an olive. *Seeds* few. Hook. fil. Fl. Br. Ind. I, 190: Miq. Fl. Ind. Bat. I, pt. 2, 107. *Phoberos Roxburghii*, Benn. Pl. Jav. Rar. 192. *Ludia spinosa*, Roxb. Fl. Ind. ii. 507. *Flacourtia stigmaraota*, Wall. Cat. 6678, in part.

Penang, Curtis; Perak, King's Collector. Distrib. Burmah, Sumatra.

3. *S. CRENATA*, Clos. in Ann. Sc. Nat., Ser. IV, Vol. 8, 250. A tree, glabrous except the inflorescence. *Leaves* coriaceous, shining above, ovate to oblong-lanceolate, obtusely or sharply acuminate, obscurely glandular-crenate; the base narrowed, rarely rounded, obscurely 3-5 nerved; lateral nerves about 5 pairs, faint; length 2 to 5 in., breadth 1 to 1.75 in., petiole .25 to .35 in. *Racemes* axillary or terminal, pubescent or tomentose, bracteolate, 1 to 3 in. long. *Flowers* pedicelled. *Sepals and petals* 4, rarely 5 or 6, the former tomentose and smaller than the petals. Connective of anthers glabrous. *Ovary* globular, smooth. *Style* cylindric. *Stigma* discoid. *Fruit* globose, about .75 in. in diam. Hook fil. Fl. Br. Ind. I, 191. Miq. Fl. Ind. Bat. I pt. 2, p. 167. *S. pseudo-crenata*, *acuminata*, *chinensis*, *lanceolata*, and *crassipes*, Clos. l. c. *S. sava*, Hance in Ann. Sc. Nat. Ser. 4, xviii, 182. *Phoberos crenatus*, W. & A. Prodr. 29; Dalz. & Gibs. Bomb. Fl. II. *P. lanceolatus* and *P. Wightianus*, W. and A. Prodr. 30. *P. acuminatus*, *Hookerianus*, and *Arnotianus*, Thwaites Enum. 17 and 400.

Penang, Curtis; Perak, King's Collector. Distrib. Brit. India and Ceylon, China, Philippines.

In the young state this is thorny. It is a very variable species indeed, and too near *S. rhinanthera*.

3. ERYTHROSPERMUM, Lamarek.

Trees or shrubs. *Leaves* alternate, quite entire. *Flowers* racemed, fascicled or paniced, 2-sexual. *Sepals* 4-6, imbricate in bud. *Petals* 4-6, usually small. *Stamens* 4-6; anthers lanceolate-sagittate, connective dilated. *Ovary* 1-celled; style short, stigma entire or 3-4-fid; ovules many, on 3-4 parietal placentas. *Capsule* coriaceous, 3-4-valved; valves bearing the seeds on the middle. *Seeds* few, testa coriaceous or fleshy; embryo incurved. *Distrib.* Species about 8, of which 6 are Mascarene, one is from Ceylon, and the following Malayan.

E. SCORTECHINII, King n. sp. A small glabrous tree, the branchlets lenticellate. *Leaves* thickly membranous, broadly ob-lanceolate, abruptly shortly and bluntly acuminate, faintly crenate-serrate, the base slightly narrowed; nerves 5 to 6 pairs, thin, anastomosing .25 in. from the margin; length 4 to 6 in., breadth 2 to 2.5 in.; petiole .5 in.; *Stipules* caducous. *Racemes* two to four in a lax terminal panicle, 3 to 4 in. long in flower, and twice as long in fruit. *Ovary* glabrous, 12—20 ovuled; style glabrous; stigma 3-lobed. *Capsules* on thin pedicels .5 in. long, globular, smooth, .35 in., in diam., crowned by the conical style with 3-eleft stigma, 3-valved, 1-seeded. *Seed* sub-globular with red pulp.

Perak. Scortechini.

This species was collected only once by Father Scortechini; and he found no flowers. He describes it as a tree 30 to 40 feet high. No species of the genus has hitherto been described from any Malayan province, Ceylon being the nearest country in which one is indigenous.

4. FLACOURTIA, Commers.

Trees or shrubs, often spinous. *Leaves* toothed or erenate. *Flowers* small, dioecious, rarely 2-sexual. *Sepals* 4-5, small, imbricate. *Petals* 0. *Stamens* many; anthers versatile. *Ovary* on a glandular disk; styles 2 or more, stigmas notched or 2-lobed; ovules usually in pairs on each placenta. *Fruit* indehiscent; endocarp hard, with as many cells as seeds. *Seeds* obovoid, testa coriaceous; cotyledons orbicular. *Distrib.* About 12 species, natives of the Old World, some being cultivated in various tropical countries.

FLACOURTIA RUKAM, Zoll. et. Moritzi Verz. 33. A tree; the young branches puberulous and lenticellate. *Leaves* ovate or ovate-lanceolate, membranous, shortly acuminate, slightly and remotely crenate-serrate, the base narrowed, glabrous except the puberulous petiole and midrib; nerves 7 to 8 pairs; length 4 to 5.5 in., breadth 2 to 2.5 in., petiole .3 in. *Racemes* three times as long as the petioles, axillary, pubescent, bracteolate,

4 to 8-flowered. *Flowers* dioecious, pedicelled. *Sepals* 4, reniform, tomentose internally. *Male flower* with a circle of glands outside the numerous stamens; pistil none. *Female flower* with a sub-entire flattish fleshy disc at the base of the globular glabrous ovary: *styles* 6 to 8, distinct to their bases, stout, spreading: *stigmas* discoid with a mesial groove. *Fruit* sub-globular, .5 to .75 in. long, its pericarp succulent, when dry 6-8 ridged: Hook. fil. Fl. Br. Ind. I, 192, Clos in Ann. Sc. Nat. Ser. iv. Vol. 8, p. 216, Miq. Fl. Ind. Bat. I, Pt. 2, 104. *F. cataphracta*, Bl. (not of Roxb.) Bijdr. 55, (probably).

Perak. Common at low elevations. Malacca, Griffith. Distrib. Burmah, Sumatra and the Malayan Archipelago generally; Philippines.

This species is badly represented in collections and is not well understood, all published descriptions of it being very brief. Clos diagnoses it by its having 5 sepals; but I do not find that this character holds at all. It approaches *F. inermis*, Roxb. very closely in foliage and fruit. According to Roxburgh, who originally described *F. inermis* from plants from the Moluccas cultivated at Calcutta, its flowers are hermaphrodite; and in that respect they differ from those of the other species of the genus. The only authentic specimens of *F. inermis* which I have seen were cultivated in the Bot. Garden, Calcutta, and these are undoubtedly hermaphrodite. The styles are moreover very short and united, and the 5 stigmas form a radiating star on the apex of the ovary, each stigma being cuneate-emarginate. The stigmas of *F. Rukam* are quite different; inasmuch as they are discoid and the styles are distinct to the very base. Forbes's Sumatra specimens No. 1206^a appear to belong to *inermis*, and they are the only uncultivated ones which I have seen. The fruit of *Rukam* as well as of *inermis* is eatable, although sour. I have not seen an authentic specimen of Blume's *F. cataphracta*; but I can readily believe that it is *F. Rukam*, which is a common Malayan plant. The plants issued as Wall. Cat. 6673 belong (as regards many of the sheets) in my opinion to this, and not to *F. inermis*, Roxb.

2. FLACOURTIA CATAPHRACTA, Roxb. in Willd. Sp. Pl. iv. 830; Cor. Pl. iii. t. 222; Fl. Ind. iii. 834. A small tree, often thorny when young. Branchlets glabrous, lenticellate. *Leaves* membranous, oblong or oblong-lanceolate, bluntly acuminate (the older sometimes blunt) obscurely crenate-serrate, narrowed to the base; both surfaces glabrous, shining; the 3-4 pairs of nerves thin, sub-erect; the reticulations minute; length 3 to 4 in., breadth 1.25 in., petiole 3 in. *Flowers* in axillary racemes shorter than the leaves, small, (.15 in. diam.); ovary flask-shaped; stigmas 4-6, capitate. *Fruit* the size of an olive, purple. Hook. fil. Fl. Br. Ind. I, 193, Clos. in Ann. Sc. Nat. Ser. IV, Vol. 8, p. 216 (not of Roth, Blume, or Dalzell). *F. Jangomas*, Gmel. Syst., Miq. Fl. Ind.

Bat. Vol. I, pt. ii, 105. *Stigmarosa Jangomas*, Lour. *Rounea Jangomas*, Spreng. *Spina spinarum*, Rumph. Amb. Cap. 43, p. 38, xix, t. 1, 2.

In all the provinces. Distrib. British India, China. Often cultivated.

5. HYDNOCARPUS, Gærtner.

Trees. *Leaves* alternate, serrate or entire; transverse venules numerous; stipules deciduous. *Flowers* solitary, or in irregular axillary few-flowered racemes or fascicles, monœcious or diœcious. *Sepals* 5, equal or unequal, imbricate in bud. *Petals* 5, with a scale opposite each. FL. ♂; *Stamens* 5—8; anthers reniform, connective broad. *Ovary* 0 or rudimentary. FL. ♀; *Stamens* as in the ♂ but without pollen, or reduced to staminodes. *Ovary* 1—celled; stigmas 3—6, sessile or subsessile, spreading, dilated, lobed; ovules many, on 3—6 parietal placentas. *Berry* globose, many-seeded, rind hard. *Seeds* many, imbedded in pulp; testa crustaceous, striate; albumen oily; cotyledons very broad, flat. Distrib. Species about 12, tropical Asiatic.

1. HYDNOCARPUS CASTANEA, Hf. and Th. Fl. Br. Ind. I, 197. A glabrous tree 50 to 60 feet high. Branches and young shoots brown. *Leaves* coriaceous, narrowly elliptic to oblong, gradually narrowed to the shortly acuminate apex; the base unequal, rounded at one side, contracted at the other; both surfaces shining and pale brown when dry; nerves 4—9 pairs, sub-erect, thin but prominent as are the reticulations; length 7 to 14 in., breadth 2·5 to 4·5 in.; petiole thickened at both ends and bent at the apex, .75 to 1 in. long. *Flowers* in axillary clusters of 2-6, male and female alike and about equal in number, both on tawny-pubescent pedicels 1·25 in. long. *Sepals* obovate, imbricate, shorter than the petals, the exposed parts tomentose. *Petals* .6 in. long, linear-oblong, the scales linear-obtuse, short. *Stamens* with thick subulate filaments; anthers ovate-cordate; rudimentary ovary small, hispid. *Female flowers* like the male, the stamens barren. *Ovary* ovoid, acuminate, tomentose: stigmas sessile; ovules numerous. *Fruit* on a pedicel 1·25 to 1·54 in. long, globular, 1 in. to 1·5 in. diam., minutely rugose, densely covered with short fulvous tomentum; stigma persistent, hemispheric. *Seeds* large, angular. Kurz F. Flora B. Burmah, I, 77.

Malacca; Perak; common. Distrib. Burmah.

2. HYDNOCARPUS NANA., King n. sp. A shrub or small tree; the branches and young shoots glabrous or (var. *pubescens*) pubescent. *Leaves* subcoriaceous, from ovate-lanceolate to oblong-lanceolate, inequilateral, subfalcate, shortly acuminate, remotely and minutely mucronate-serrulate, narrowed and unequal at the base, shining and glabrous except the midrib and nerves which, on both surfaces, are usually more or less

pubescent; nerves 5 to 8 pairs, spreading or sub-erect, thin but prominent beneath; length 2·5 to 5 in., breadth ·75 to 2·5 in., petiole ·25 to ·35 in.; stipules persistent, linear-lanceolate, pubescent, about as long as the petioles. Male inflorescence small, supra-axillary, 1 to 4-branched, uniparous, tomentose, bracteolate, cymes not much longer than the petioles: flowers ·25 in. in diam. *Sepals* 5, rotund, the 3 external slightly imbricate, pubescent; the 2 inner much imbricate, glabrescent. *Petals* 5, smaller than the sepals, fleshy, with long white silky hairs externally, and each internally with a small oblong scale. *Filaments* short, thick, sericeous, the connective reniform; the anther cells small, remote from each other. Ovary 0. *Female flowers* solitary, supra-axillary, on glabrous pedicels ·5 in. long. *Sepals* and *petals* as in the male: stamens without pollen: ovary ovoid, tomentose; stigmas 3, large, flat, bifid, reflexed. *Fruit* on a pedicel ·5 in. long, solitary, axillary, depressed-globular, minutely rugose, and velvety tawny-tomentose; about 1 in. in diam., or less; pericarp dry, thin. *Seeds* 3 or 4, plano-convex, 5 in. long.

Penang, Curtis, 854: Perak; King's Collector, Scortechini, Wray.

This varies considerably as to size of leaf and fruit and in the amount of pubescence. In some specimens of the male plant the leaves towards the apices of the branches are much reduced in size. The form which has larger more pubescent leaves may be separated as a variety, and farther acquaintance with it may prove that it is separable as a species.

Var. *pubescens*. Young parts, branchlets, and lower surfaces of adult leaves pubescent.

Perak, at Goping, King's Collector, No. 761.

3. *HYDNOCARPUS CURTISII*, King, n. sp. A glabrous shrub or small tree. Young branches slender, pale brown when dry. *Leaves* coriaceous, shining on both surfaces, oblong-lanceolate, rarely ovate, slightly inequilateral, gradually narrowed to the acuminate apex; the base unequally narrowed, rarely rounded; nerves 7 to 11 pairs, thin, spreading; reticulations obscure on the upper surface; length 6 to 12 in., breadth 2·25 to 3 in.; petiole less than ·5 in., thick. *Male flowers* in small, axillary, branched, bracteolate, uniparous cymes not much longer than the petioles, ·75 in. in diam.; pedicels scurfy-tomentose, ·75 in. long. *Sepals* reflexed, ovate, blunt, imbricate, pale, minutely pubescent, shorter than the petals. *Petals* 5, narrowly oblong, blunt, concave at the apex, ·65 in. long, glabrous; the gland nearly as long, linear. *Anthers* much longer than the filaments, cordate at the base. Ovary 0. *Female flowers* on shorter, grooved, pedicels; ovary elongate-ovoid, tawny-tomentose: the stigmas 3, fleshy, bifid, spreading. *Fruit* on a stout pedicel nearly ·5 in. long, globose with long apical papilla, minutely rugose and velvety, vertically ridged; the stigmas persistent; nearly 1·5 in. long and 1 in. in diam. *Seeds* few, plano-convex, ·4 in. long.

Penang, Curtis, 800, 1534. Perak; King's Collector, Scortechini.

No specimen that I have seen has female flowers showing anything besides the ovary. Complete female flowers are much wanted.

4. *HYDNOCARPUS SCORTECHINII*, King n. sp. A tree, all parts except the sepals glabrous. Branchlets pale brown when dry, angular. *Leaves* sub-sessile, coriaceous, shining on both surfaces, slightly inequilateral, elliptic or elliptic-oblong, tapering to the acuminate apex, the edges slightly recurved when dry; the base rounded, slightly unequal; nerves 7-8 pairs, thin, spreading; the reticulations minute and distinct on both surfaces: length 5 to 7 in., breadth 2·5 to 3·5 in., petiole about ·2 in. *Cymes* small, monœcious, axillary or extra-axillary, on the young branches, about three times as long as the petioles, densely bracteolate, 2-3 branched. *Male flowers* on pedicels ·75 in. long. *Sepals* elliptic, blunt, their apices incurved, puberulous. *Petals* smaller than the sepals but of the same shape; the gland nearly as long, linear. *Anthers* narrow, elongate; filaments short, conical. *Ovary* none. *Female flowers* like the males, but on short pedicels and the stamens barren; ovary ovoid below, its upper half cylindric, ridged, pale-coloured, glabrous; stigmas large fleshy, reflexed, shortly bifid. *Fruit* (young) ovoid, minutely rugose, glabrous.

Dinding Islands; Scortechini, Curtis.

This species bears a general resemblance to *H. Curtisii*. But it differs from that species in having broader leaves on shorter petioles, much broader and shorter petals, and a glabrous ovary. Ripe fruit of this is unknown.

5. *HYDNOCARPUS CUCURBITINA*, King, n. sp. A tree 60 to 80 feet high; very young branches and leaves with minute ferruginous mealy tomentum; otherwise glabrous. *Leaves* thinly coriaceous, slightly inequilateral and contracted at the base on one side, elliptic-oblong, tapering to either end, the apex with a short rather blunt acumen, the edge very slightly recurved when dry; both surfaces, but especially the lower, shining and with the transverse veins and minute reticulations very distinct; main nerves 5 to 6 pairs, sub-erect, thin; length 3·5 to 5 in., breadth 1·5 to 2·25 in., petiole ·25 in. *Cymes* dicecious, (the female flowers few) axillary, three times as long as the petioles, bracteolate, 3 to 6-branched. *Male flowers* on pedicels ·35 in. long, about ·3 in. in diam. *Sepals* broadly ovate, blunt, pubescent-tomentose externally. *Petals* ovate-rotund, glabrous, thin, each with a fleshy scale with white ciliate edges and nearly as large as itself. *Anthers* ovate-cordate, glabrous; the filaments short, conical; *Ovary* rudimentary, sericeous. *Female flowers* like the males, but on slightly shorter pedicels and with smaller barren stamens. *Ovary* cylindric, densely sericeous-tomentose: *stigmas* elongate, fleshy,

bifid at the apex, not reflexed when young. *Fruit* narrowly obovoid, cylindric, mamillate at the apex and contracted at the base; minutely rugose, smooth, dark brown when ripe and from 3 to 5 in. long; carpophore and pedicel about .5 in. each, or more. *Seeds* one or two, obovoid, smooth, about 1 in. long.

Perak, up to elevations of 1,000 feet. Common.

Distinguished from every hitherto described species of this genus by its elongate cucumber-shaped fruit. The scales of the petals are also much larger and broader than is usual in *Hydnocarpus*.

6. *HYDNOCARPUS WRAYI*, King, n. sp. A small sub-glabrous tree. Young branches with pale brown, minutely lenticellate, puberulous bark. *Leaves* sub-coriaceous, elliptic, shortly and abruptly acuminate, the edge slightly recurved when dry; the base rounded, sometimes narrowed and unequal; the reticulations on both surfaces very prominent; upper surface glabrous, shining, minutely pustulate when dry; the lower of a pale brown when dry, glabrous except the pubescent midrib and 8-9 pairs of bold sub-erect nerves; length 8 to 10 in., breadth 3.5 to 5 in.; petiole less than 5 in., stout. *Male flowers* nearly 5 in. in diam., in very minute, axillary, pedicelled, few-flowered cymes. *Sepals* 5, slightly imbricate, rotund, pubescent, larger than the petals. *Petals* 5, of the same shape as the sepals but smaller, each with a fleshy roughly cuneate scale the apex of which is irregularly toothed and ciliate. *Stamens* 15, the filaments glabrous, much thickened at the base; anthers broadly ovate, cordate. *Female flowers* unknown. *Fruit* narrowly ovoid, tapering at both ends, often 3 in. long. and 1.75 in. in diam., minutely fulvous-velvety; the apical mamilla .75 in. long with its apex depressed and crowned by the 3 fleshy bifid stigmas; one-celled, several-seeded. *Pedicel* short, stout. *Seeds* embedded in a little pulp, elongate, plano-convex, .75 in. long.

Perak. King's Collector, No. 3800; Wray, No. 2608.

This species has more stamens than are usual in the genus *Hydnocarpus*. In this respect it appears to form a connecting link with *Taraktogenos*: but in shape the anthers do not agree with those of that genus.

6. *TARAKTOGENOS*, Hassk.

Trees with entire alternate leaves and minute fugaceous stipules. *Flowers* in more or less dense, short, axillary, few-flowered cymes; a few hermaphrodite, but the majority stamiferous only. *Stamiferous flower*; *sepals* 4, in decussate pairs, much imbricate, rotund, concave; *petals* 8, in two rows, smaller than the sepals, imbricate, each with a gland at its base; glands less than half as large as the petals, fleshy,

cuneate, plano-convex, ridged, the apex often irregularly toothed and with 2 or 3 cylindrical pits. *Stamens* 20 to 32, the anthers deeply cordate. *Female flowers* like the males, but the sepals often only 3, the petals 6, and the stamens 16 or 17; *ovary* elongate-ovoid, sulcate, divided above into 4 oblong, divergent, reflexed lobes, each bearing a stigmatic surface internally; 1-celled with 4 multi-ovulate parietal placentas. *Fruit* large, globular or ovoid, with hard fibrous or woody rind, and several large seeds embedded in a scanty pulp. *Seeds* with thick hard testa, copious albumen, and straight central embryo; the cotyledons large, cordate, foliaceous, 3-nerved. Species probably about 8: all Malayan.

Note.—This genus was founded by Hasskarl (Retzia, i. 127) on the plant named *Hydnocarpus heterophyllus* by Blume (Rumphia, iv, 22, t. 178 B., fig. 1, and Mus. Bot. i, 16). Until now that plant has been the only known species. But the following have been discovered by Messrs. Kunstler and Wray in Perak. And from the similarity in externals to *Hydnocarpus*, and from the imperfect nature of the Herbarium materials of the latter, it appears to me extremely probable that several things now referred to *Hydnocarpus* really belong to *Taraktogenos*. In the Calcutta Herbarium, there are imperfect materials of of, at least, 8 undescribed species which belong either to one or other of these two genera.

1. *TARAKTOGENOS SCORTECHINII*, King, n. sp. A large glabrous tree; young branches with dark-coloured bark. *Leaves* coriaceous, shining, inequilateral, oblong-lanceolate, oblong or elliptic, with a short abrupt rather blunt acumen and slightly wavy edges; the base slightly narrowed and unequal, 3-nerved; the upper surface smooth, the lower rough from the prominent reticulations and 4 to 5 pairs of ascending nerves; length 3·5 to 7 in., breadth 1·5 to 2·75 in.; petiole ·5 to ·75 in. *Cymes* triehotomous, 1 in. in diam., on pedicels as long as the petioles, solitary, axillary, few-branched, uniparous. *Male flowers* ·5 to ·6 in. in diam.; pedicels ·25 to ·35 in. *Petals* densely sericeous externally; the basal scales less than half their length. *Stamens* 20 to 24, filaments hirsute, anthers sagittate. *Female flowers* and fruit unknown.

Perak; Seorteehini, No. 833; Wray, 1169.

Var. *gracilipes*, King; petioles longer (·75 to 1 in.) and more slender; leaves smaller, 2·5 to 4 in. long, by 1·25 to 1·5 in. broad.

Perak; Bujong-Malacca; Seorteehini, No. 1894.

2. *TARAKTOGENOS KUNSTLERI*, King, n. sp. A sub-glabrous tree 40 to 60 feet high. Young branches fulvous-puberulous. *Leaves* coriaceous, unequal-sided, oblong-lanceolate to elliptic, shortly acuminate; the base narrowed and unequal, 3-nerved; both surfaces shining, the lower rough from

the prominent nerves and reticulations; lateral nerves 3 to 5 pairs on the narrower and 4 to 7 pairs on the wider side, sub-erect, prominent; length 4.5 to 6 in., breadth 1.5 to 3 in.; petiole .3 to .5 in., puberulous. *Cymes* dense, many flowered. *Male flowers* as in the last, the scales half as long as the petals, their apices erose, glabrous. *Stamens* 32; the filaments short, subulate, sericeous; anthers elongate, deeply cordate. *Female flowers* like the males, but sepals 3, petals 6, and stamens 17 only. *Ovary* ovoid, glabrous, deeply sulcate, with 4 radiating reflexed oblong stigmas, 1-celled, with 4 multi-ovulate parietal placentas. Fruit solitary, globular, smooth, 2.5 in. in diam.; the pericarp thick, the outer layer fibrous, the inner woody. *Seeds* embedded in scanty pulp, plano-convex, .75 in. or more in length.

Perak; in dense forest at low elevations; King's Collector, Nos. 6042 and 8183; Wray, 3389.

3. *TARAKTOGENOS TOMENTOSA*, King, n. sp. A tree 60 to 80 feet high. Young branches fulvous-tomentose. *Leaves* coriaceous, often inequilateral, ovate-oblong, abruptly and very shortly acuminate, the base rounded and slightly unequal; the reticulations prominent on both surfaces, upper surface smooth, shining; the lower fulvous-tomentose; lateral nerves 6 to 7 pairs, bold, sub-erect; length 5 to 7 in., breadth 2.5 to 3 in.; petiole .25 to .5 in., tomentose. *Cymes* woody, dense, short. *Fruit* ovoid, smooth; when ripe 3 in. long; the pericarp nearly .5 in. thick, the outer layer fibrous, the inner thin and woody.

Perak; at an elevation of 500 feet; King's Collector, No. 7795.

Flowers of this are unknown. It is readily distinguished from the former two species by its tomentose leaves, but in other respects it much resembles them.

I subjoin a description of the Burmese species referred to *Hydnocarpus heterophyllus* by Kurz.

TARATOGENOS KURZII, King. A tree 40 to 50 feet high. Youngest branches, leaves and inflorescence tawney-pubescent; otherwise glabrous; older branches grey, minutely lenticellate. *Leaves* sub-coriaceous, lanceolate or oblong-lanceolate, rarely elliptic, abruptly and very shortly and bluntly apiculate; the base narrowed and equal-sided; both surfaces shining, the reticulations minute and distinct; main nerves 6 to 7 pairs, sub-erect; length 7 to 10 in., breadth 2 to 3.5 in., petiole .75 to 1 in., thickened at the apex. *Cymes* axillary or extra-axillary, from the smaller branches, on thick peduncles, nearly as long as the petioles, with many very short branches at their apices, many-flowered. *Male flowers* .3 in. in diam., on pedicels less than .5 in. long. *Sepals* 4, imbricate, ovate-rotund, blunt, concave, pubescent externally. *Petals* 8, broadly ovate, blunt, with ciliate edges, each with a flat fleshy pubescent gland with

white eiliate apex. *Stamens* 24; anthers elongate, deeply eordate; the filaments short and with long white hairs. Female flowers unknown. *Fruit* globular, as large as an orange, on a thick peduncle .25 in. long; the rind minutely granular, tawny-velvety, the outer layer thick and fibrous, the inner thin. *Seeds* numerous, irregularly oval, embedded in pulp. *Hydnocarpus heterophyllus*, Kurz (not of Blume) F. Flora B. Burmah i. 77. Wall. Cat. (*indeterminatae*) No. 7508.

Burmah; Griffith, (Kew, Dist. 4363), Falconer, Brandis, Kurz, Galtatly. Chittagong; Lister, Sehlieh. Sylhet, Wall. Cat., 7508.

This is the plant referred to in Hooker's Fl. B. Ind. i. 197 as "too immature for description." Since that remark was written, better material was got from Burmah, on which Kurz described the species in his Forest Flora as *Hydnocarpus heterophylla*, Bl., with Blume's description of which it, however, manifestly disagrees. Kurz had modified the description of the genus *Hydnocarpus* to admit this plant. Female flowers of it I have never seen: but the males agree with those of *Taraktogenos*.

7. PANGIUM, Reinw.

A tree with entire, rarely 3-lobed, ovate-eordate, acuminate leaves. *Flowers* dioecious, axillary, solitary, large. *Calyx* globose, sepals 2-3, concave. *Petals* 5-6, each with a large sericeous scale at its base. *Male Fl.*, stamens 20 to 25; anthers ovate, innate; *ovary* 0. *Female Fl.*, staminodes 5 or 6; *ovary* ovoid, 1-celled, with 2 parietal multi-ovulate placentas; *stigma* sessile, obscurely 2-4 lobed. *Fruit* large, ovoid, indehiscent, many-seeded, pulpy. *Seeds* large, ovoid, angled, rugose, with a large elongate hilum, copious oily albumen, and broad foliaceous cotyledons.

P. EDULE, Reinw. in Syll. Pl. Soe. Ratisb., ii. p. 13. *Leaves* 6 to 8 in. long, by 3.75 to 5.5 in. broad. *Ripe fruit* with crustaceous pericarp, brown with white dots, 9 in. long by 6 in. in diam.; seeds nearly 2 in. long. Miq. Fl. Ind. Bat. I, pt. 2, p. 109. Benn. Pl. Jav. Rar. 205, t. 43. Blume Rumphia iv, 20, t. 178; Mus. Bot. i, p. 14.

Perak; King's Collector. Distrib. Malayan Archipelago.

8. RYPAROSA (RYPARIA), Blume.

Trees or shrubs with entire, alternate, elongate, petiolate leaves finely reticulate and more or less glaucescent beneath. *Flowers* rather small, dioecious; the males in long axillary racemes; the females in shorter racemes, solitary, or in pairs. *Calyx* globose in bud, 3 to 5-cleft. *Petals* 5, imbricate, coriaceous; in the female flower each with a large

sericeous scale at its base. *Male flower*; filaments united in a column with 5, ovate, 2-celled, extrorse anthers at its apex. *Female flower*; *staminodes* 5, alternate with the petals. *Ovary* 1-celled, with 1 to 3, biovulate, parietal placentas. *Stigmas* 2 to 3, sessile, broad, emarginate. *Fruit* baccate with little pulp; the pericarp coriaceous, tomentose. *Seeds* 1 or 2, sub-globular, smooth.

Note.—This genus was first published by Blume in his *Bijdragen* (p. 600) as *Ryparosa*, and in that work he published only the single species *R. caesia*. In a footnote to the preface of his *Flora Javæ* (p. viii), the same author referred to the genus (apparently by inadvertence) as *Ryparia* instead of *Ryparosa*; and the name *Ryparia* has been adopted by most subsequent authors. Blume regarded the genus as *Euphorbiaceous*, in which view he was followed by Endlicher (Gen. 5836), Hasskarl (Pl. Jav. Rar., p. 267), and Baillon (Etud. Euph., p. 339). Müll. Arg. (in DC. Prod. XV, ii., p. 1260) excluded the genus from *Euphorbiaceæ*; and, in their *Genera Plantarum*, the late Mr. Bentham and Sir J. D. Hooker, (G. P. iii., 257), also exclude it; but, having seen no specimens either of it or of *Bergsmia*, they make no suggestion as to the true position of *Ryparosa* or of the relation of *Bergsmia* to it. Kurz (Journ. Bot. for 1873, p. 233, and For. Fl. Burm. I. 76) was the first to refer *Ryparosa* to *Bixineæ*. But Kurz made the mistake of describing in the latter work, as "*Ryparia caesia*," a plant which agrees neither with Blume's description nor with his specimens of *Ryparosa caesia*. The name of Kurz's plant I have therefore altered to *R. Kurzii*. In 1848, Blume published, in *Rumphia* IV, p. 23, t. 178 C., fig. 2, a new genus called *Bergsmia* which, as Kurz also pointed out (Journ. of Bot. for 1873, p. 233), is nothing more or less than his older *Ryparosa*. Only one species (*B. javanica*) was known to Blume. To this Miquel added (Fl. Ind. Bat. Suppl. 389) two species, namely, *B. Sumatrana* and *B. ? acuminata*. I have seen neither of these; but the eymose inflorescence of *B. Sumatrana* leads me to believe that it must be a *Hydnocarpus*, while the second (*B. ? acuminata*) was referred doubtfully to *Bergsmia* by its author himself. The collections brought, within the past year or two, from Perak by the collectors of the Calcutta garden contain copious suites of specimens of *Ryparosa* and, from an examination of these, I have no doubt that *Ryparosa* belongs to *Bixineæ*, and that *Bergsmia* must be reduced to it. Besides the seven species described below, there are in the Calcutta Herbarium imperfect materials belonging to several additional species from Perak, and to some from Sumatra. Wall. Cat. No. 7847 B. (from Penang), and Beccari's No. 702 (from Sumatra), are also clearly species of *Ryparosa*.

1. *RYPAROSA KURZII*, King. A tree or shrub. Young shoots ad-

pressed ferruginous-pubescent. *Leaves* elliptic to elliptic-oblong, shortly and bluntly acuminate, the base slightly narrowed; upper surface shining, glabrous except the puberulous midrib; lower glaucous, the reticulations distinct; nerves 7-8 pairs, spreading, prominent beneath; length 8 to 12 in., breadth 4 to 5.5 in.; petiole 1.5 in., thickened in its upper fourth, pubescent. *Male racemes* 5 to 10 in. long, ferruginous-tomentose, the petals reflexed: *female racemes* shorter and subglabrous. *Fruit* globose, the size of a cherry, lenticellate, 2-seeded. *R. cæsia*, Kurz F. Fl. Burm., i, 78, not of Bl.

Andamans; Kurz, King's Collector. Nicobars, Kurz.

2. *RYPAROSA WRAYI*, King, n. sp. A tree 60 to 80 feet high, glabrous except the inflorescence. *Leaves* coriaceous, ovate-lanceolate to oblong-lanceolate or elliptic, the apex sub-acute; slightly narrowed to the base; upper surface shining; lower dull yellowish green when dry, the midrib and 4 pairs of sub-erect nerves prominent below as are the transverse veins; length 6 to 10 in., breadth 2.5 to 4.5 in.; petiole 1 to 1.25 in., slightly winged at the apex. *Racemes* solitary or in pairs, axillary or from below the leaves, 6 to 9 in. long, longer in fruit. *Male flowers* pedicelled. *Calyx* with 3 broad ovate teeth, pubescent externally. *Petals* 5, oblong-ovate, pubescent externally, each with a triangular sericeous scale half as long as itself. *Staminal tube* pubescent; anthers 5, ovate, reflexed. *Female flower*; *sepals* and *petals* as in the male; disc annular with 5 conical staminodes. Ovary rugulose, pubescent, globular, 1-celled. Stigmas 2, sub-bifid, spreading. *Fruit* globular, crowned by the stigmas, rugose, pubescent, .5 to .75 in., 1-seeded.

Perak; King's Collector, Wray; rather common.

3. *RYPAROSA HULLETTII*, King, n. sp. A small nearly glabrous tree. *Leaves* membranous, obovate-elliptic, with a very short abrupt acumen, the base narrowed; both surfaces shining, the midrib and 3-4 pairs of spreading nerves prominent on the lower, as are the reticulations; length 5 to 7 in., breadth 3 in.; petiole 1.5 in., thickened in its upper fourth. *Male racemes* a foot or more long, puberulous. *Male flowers*; calyx membranous, with 3 broadly ovate teeth. *Petals* 5, ovate; scale small, sericeous. *Staminal tube* glabrous; *anthers* 5, ovate, reflexed. *Female flower* and fruit unknown.

Singapore: on Bukit Timah, R. H. Hullett.

Distinguished from the other species by its thin obovate leaves.

4. *RYPAROSA SCORTECHINII*, King, n. sp. A slender tree; the branchlets and inflorescence rusty, otherwise glabrous. *Leaves* large, thinly coriaceous, oblong-lanceolate or oblanceolate, shortly and abruptly acuminate, gradually narrowed from the middle to the base; both surfaces glabrous, the upper shining, the lower dull, pale; the midrib and 5 or 6 pairs of

nerves very prominent; length 10 to 15 in., breadth 4 to 6 in.; petiole 2 to 2.5, thickened and bent at the apex. *Racemes* in tufts from tubercles on the stem and large branches, the male 8 to 12 in. long. *Calyx* splitting into 3 ovate segments, tomentose. *Petals* 4, oblong; the gland large, rotund, sericeous. *Female racemes* shorter; sepals and petals as in the male; ovary tomentose, 4-angled; styles 2, discoid. *Fruit* angled when young: when ripe transversely oblong, 1.5 in., by 1 in., velvety rusty-tomentose with green or white dots; seeds two, plano-convex.

Perak: Scortechini, Kunstler, Wray; common.

The male flowers have been found only by Scortechini from whose field notes the above description of them has been taken.

5. *RYPAROSA KUNSTLERI*, King, n. sp. A glabrous tree, the branchlets smooth. *Leaves* coriaceous, ovate-oblong, obovate-oblong to oblong, shortly and abruptly acuminate, the base narrowed; upper surface shining; lower dull, pale, much reticulate, the midrib and 5-7 pairs of nerves very prominent; length 5 to 8 in., breadth 2.5 to 3.5 in.; petiole 1.25 to 1.75 in., swollen and bent towards the apex. *Racemes* axillary, solitary, rarely 2-3 from an axil, the male 6 to 8 in. long, the female half as long; flowers pedicelled. *Male fl.* *Calyx* thin, pubescent outside, with 3 ovate broad teeth. *Petals* 5, oblong-lanceolate, pubescent externally, each with a large sericeous gland at its base; *staminal tube* glabrous, the anthers ovate-oblong. *Female flower.* *Sepals* and *petals* as in the male; annular disc at base of ovary small; staminodes none. *Ovary* ovoid, angled, tomentose, 1-celled, with 4 parietal bi-ovulate placentas; stigmas obovate, radiating. *Fruit* globular, yellowish, velvety, about 1.5 in. diam.; seeds 5 or 6, oblong, compressed, striate, about .75 in. long.

Perak, at elevations up to 800 feet; common. A tree 40 to 100 feet in height, with shorter and (in proportion) broader leaves than *R. fasciculata*, 4 stigmas and more globular pedicellate fruit.

6. *RYPAROSA FASCICULATA*, King, n. sp. A glabrous tree 30 to 60 feet high. Young branches lenticellate. *Leaves* thinly coriaceous, narrowly oblong, acuminate, the base narrowed, shining above, pale beneath; midrib, 5 to 7 pairs of lateral nerves, and the bold sub-erect transverse nerves and reticulations very distinct especially beneath; length 9 to 15 in., breadth 2.25 to 3.25 in.; petiole 1 to 1.5 in., grooved, thickened in its upper fourth. *Racemes* in fascicles of 4-7 from tubercles on the large branches and stem. *Petals* rotund, much imbricate and inflexed. *Female flower* with annular disc bearing 5 conical staminodes, the petals with hairy scales at their bases; stigmas 3, large, reniform. *Fruit* sessile, rusty-tomentose, pyriform, the apex mammillate and crowned for some time by the remains of the stigmas, about 6-seeded, 1.5 to 2 in. long.

Perak at elevations up to 800 feet; common.

7. *RYPAROSA CAESIA*, Bl. Bijdr. 600; *Ryparia*, Fl. Javae (præf. VIII). A small tree, the branchlets and inflorescence ferrugineous-silky. *Leaves* coriaceous, oblong, shortly acuminate, the base slightly narrowed; upper surface shining; lower pale, rather densely adpressed-sericeous; nerves 5 to 6 pairs, ascending; length 6 to 9 in.; breadth 2 to 3 in.; petiole 1·25 in., stout, thickened in its upper fourth. *Racemes* solitary, supra-axillary, the female longer than the leaves. *Male flowers*; *sepals* and *petals* 4, tomentose, the latter with a small basal hairy scale. *Staminal tube* short, glabrous; *anthers* 4, broadly ovate, reflexed. *Fruit* crowned by the 2 shortly-stalked fleshy radiating reniform emarginate stigmas, globose, ferruginous-tomentose, 5 to 7 in. diam. Hassk. Pl. Javan. Rar. 267: Baillon Euphorb. 339. Miq. Fl. Ind. Bat. i. pt. 2, p. 361. DC. Prod. XV, 2 p. 1260. Kurz in Journ. Bot. 1873, p. 233.

Java, Blume. Sumatra; Teysmann, Forbes, at an elevation of 3,500 feet.

Blume describes the lower surfaces of the leaves as “*tenuiter strigosis*”; but the hairs, although adpressed, are not stiff but silky. This is the only species in which the hairs on the lower surface of the leaves are at all conspicuous. The leaves of the Andaman plant referred to *R. caesia* by Kurz are nearly glabrous beneath.

ORDER X. PITTOSPOREÆ.

Trees or shrubs. *Leaves* alternate or subverticillate, quite entire (very rarely toothed); exstipulate. *Flowers* usually hermaphrodite, terminal or axillary. *Sepals* 5, imbricate. *Petals* 5, hypogynous, imbricate. *Torus* small. *Stamens* 5, opposite the sepals; anthers versatile. *Ovary* 1-celled, with 2-5 parietal placentas, or 2-5-celled by the projection of the placentas; style simple, stigma terminal 2-5-lobed; ovules many, parietal or axile, anatropous. *Fruit* capsular or indehiscent. *Seeds* usually many, albumen copious; embryo small, radicle next the hilum.—Distrib. Genera 9; species about 90, chiefly Australian.

1. PITTOSPORUM, Banks.

Erect trees or shrubs. *Sepals* free or connate below. *Petals* erect, claws connivent or connate. *Stamens* 5, erect; anthers 2-celled, introrse, bursting by slits. *Ovary* sessile or shortly stalked, incompletely 2-3-celled; ovules 2 or more on each placenta. *Capsule* 1-celled, woody, 2- rarely 3-valved; valves placentiferous in the middle. *Seeds* smooth, imbedded in pulp. Distrib. Species about 50, subtropical Asiatic, Australian, and Oceanic.

PITTOSPORUM FERRUGINEUM, Ait. DC. Prod. I, 346. A tree 40 to 60 feet high. Young branches leaves and inflorescence softly ferruginous-pubescent. *Leaves* membranous, lanceolate or ovate-lanceolate, acute or acuminate at base and apex, the edges minutely undulate; when adult glabrous except the midrib and larger nerves; upper surface shining, the lower dull with the minute reticulations distinct; nerves 7 to 8 pairs, not prominent, spreading; length 2 to 3 in., breadth 1 to 1.5 in.; petiole slender, rusty-tomentose, .5 in. long. *Flowers*, .25 in. long, greenish-white, in short terminal corymbs. *Sepals* lanceolate, pubescent. *Petals* linear, the apices reflexed, pubescent, 3-nerved. *Ovary* cylindric, rusty-tomentose; style short, glabrous, excentric; capsule globose, when ripe compressed, rugose, with 6 to 8 black flat seeds. Hook fil. Fl. Br. Ind. i., 199. Putterl. Monogr. Pittosp. 7. Benth. Fl. Austral. i. 112. Bot. Mag. 2075.

At elevations of from 800 to 1500 feet; common. Distrib. Burmah., the Malayan Archipelago, Philippines, Queensland.

There is some variability in leaf in different individuals of this species, some having leaves narrowly lanceolate, others ovate-lanceolate.

ORDER XI. POLYGALEÆ.

Annual or perennial herbs, erect or scandent shrubs, or timber trees. *Leaves* alternate (rarely whorled) or occasionally reduced to scales or 0, simple, quite entire. *Stipules* 0. *Flowers* irregular, 2-sexual, 3-bracteate. *Sepals* 5, unequal, 2 inner often petaloid (*wing sepals*), deciduous or persistent, imbricate in bud. *Petals* 5 or 3, distinct, unequal, the inferior usually keel-shaped. *Stamens* 8 (in *Salomonina* 4-5, in *Trigoniastrum* 5) hypogynous, filaments united into a sheath, more rarely distinct; anthers opening by terminal pores, rarely by slits. *Ovary* free, 1-3-celled; style generally curved, stigma capitate; ovules 1 or more in each cell, anatropous. *Fruit* generally a 2-celled, 2-seeded, loculicidal capsule; or indehiscent and 1-seeded, or (in *Trigoniastrum*) of 3 indehiscent carpels. *Seed* usually strophiolate, albuminous, rarely exalbuminous. Distrib. The whole world except New Zealand, chiefly in warm regions; genera 16; species 450-500.

Herbs or (more rarely) erect shrubs. Capsule loculicidal, 2-celled.

Stamens 8, united; 2 interior sepals alæform 1. *Polygala*.

Stamens 4-5, united; sepals petaloid, near-

ly equal 2. *Salomonina*.

Climbing shrubs.

Stamens 8, united; fruit 1-celled, inde-

hiscent, samaroid 3. *Securidaca*.

Trees or erect shrubs.

Stamens 5, united; fruit of 3 samaroid

carpels ... 4. *Trigoniasastrum*.

Stamens 8, distinct; fruit 1-celled, not

winged ... 5. *Xanthophyllum*.

1. POLYGALA, Linn.

Herbs or more rarely shrubs. *Leaves* alternate. *Sepals* usually persistent; 2 inner larger, usually petaloid. *Petals* 3, united at the base with the staminal sheath, the inferior keel-shaped and generally crested. *Stamens* 8, filaments united for their lower half into a split sheath; anthers opening by pores. *Ovary* 2-celled, ovules 1 in each cell, pendulous. *Capsule* 2-celled, loculicidal, 2-seeded. *Seeds* almost always strophiolate and albuminous. Distrib. conterminous with the order, except Tasmania. About 250 species.

Sect. I. CHAMÆBUXUS, (Tourn. genus). Shrubs with large handsome flowers. *Calyx* deciduous, the lower sepal large, concave-cucullate. *Keel* crested. *Seeds* with a large strophiole, exalbuminous.

1. POLYGALA VENENOSA, Juss. in Poir. Dict. V. 493. A glabrous shrub 4 to 10 feet high. *Leaves* membranous, lanceolate or oblanceolate to oblong-lanceolate, acuminate, entire, narrowed to the short petiole; primary nerves 7 or 8 pairs, the secondary nerves nearly as prominent, the reticulations open, rather prominent; length 5 to 8 in., breadth 1·5 to 2·5; petiole ·2 in. *Racemes* axillary, pendulous, 1 to 3 in. long, often much elongated in fruit. *Flowers* more than ·5 in. long. *Capsule* reniform, striate, more or less 4-winged, 4 in. in diam. DC. Prod. I, 331. Bl. Bijdr. 59. Miq. Fl. Ind. Bat. I, pt. 2, p. 126. *Chamæbuxus venenosa*, Hassk. Pl. Jav. Rar., 294. Pl. Jungh., I, 126.

Var. *robusta*. Miq. l. c.; Hassk. Pl. Jungh. l. c. *Leaves* large, elliptic-oblong to oblong.

In all the Provinces at low elevations. Distrib. Malayan Archipelago.

A common shrub with handsome flowers; the inner sepals white with pink veins; the petals white, spotted with pink and the keel pink.

Sect. II. Herbs. *Flowers* small. *Calyx* deciduous after flowering. *Keel* not crested, *Seeds* albuminous.

2. POLYGALA TRIPHYLLA, Ham. in Don Prodr. 200; var. *glaucescens* Hf. Fl. Br. Ind. I, 199. A glabrous, weak, erect or ascending herb. *Leaves* thinly membranous, lanceolate or ovate-lanceolate, sub-acute, contracted into the petiole; main nerves about 7 pairs, thin; length 1·5 to 2 in., breadth ·75 in., petiole ·5 to ·75 in. *Racemes* axillary, 2 to 4 in. long, (or more) slender. *Flowers* ·1 in. long. *Lateral sepals* petaloid,

as large as the corolla. *Keel* hooded. *Capsule* sub-orbicular, entire, narrowly 2-winged. Wall. Cat. 4182 (species).

Perak. At low elevations.

Sect. III. Herbs, sometimes woody at the base. *Calyx* persistent. *Keel* crested. *Seeds* albuminous.

3. *POLYGALA LEPTALEA*, DC. Prod. I, 325. A perennial glabrous herb, the root-stock woody. *Stems* erect, rigid, boldly striate, few-leaved. *Leaves* sessile, linear-lanceolate, .5 to .75 in. long. *Racemes* 1 to 3 in. long, elongating with age, slender. *Flowers* .2 to .25 in. long. *Capsule* ovoid, emarginate at the apex, narrowly winged; Hook. fil. Fl. Br. Ind. I, 202. Benth. Fl. Austral. i. 139; Hassk. in Miq. Ann. Mus. i. 173. *P. oligophylla*, DC. l. c. 325; Wall. Cat. 4188. *P. discolor*, Ham. in Don Prodr. 199.

Nicobar Islands. Distrib. British India, Ceylon.

4. *POLYGALA BRACHYSTACHYA*, Bl. Bijdr. 69. A slender, prostrate or sub-erect herb. Branches puberulous, terete below, angled above, 4 to 6 in. long. *Leaves* with very short petioles, linear-lanceolate, bristle-pointed, glabrous, .4 in. long, and .05 in. broad. *Racemes* much longer than the leaves, few-flowered, slender, axillary or extra-axillary; pedicels nearly as long as the flowers. *Flowers* .15 in. long; lateral sepals obovate-oblong. *Keel* narrow below; the apex suddenly dilated, 3-lobed. *Capsule* sub-orbicular, the apex emarginate, the edges ciliolate. Hassk. in Miq. Ann. Mus. Lugd. Bat. I, 157; Fl. Ind. Bat. I, pt. ii, p. 125. *P. chinensis*, Linn., var. *brachystachya*.

Malacca, Griffith. Distrib. Java, Sumatra.

5. *POLYGALA TELEPHIOIDES*, Willd. Sp. Pl. iii, 876. A prostrate annual with a woody root. *Stems* 2-4 in. long, pubescent or glabrous. *Leaves* glabrous, often imbricate, fleshy, sessile, obovate or oblong, obtuse or acute, the margins recurved, the base slightly narrowed, the midrib prominent; nerves obsolete; length .5 to .65 in. *Flowers* .1 in. long, in short, extra-axillary racemes. *Capsules* .1 in. long, sub-orbicular, notched at apex, not winged. Hook. fil. Fl. Br. Ind. I, 205. DC. Prod. I, 332; W. & A. Prod. I, 36, ? *P. serpyllifolia*, Poir. Dict. V, 499; DC. l. c. 326. *P. buxiformis*, Hassk. in Miq. Mus. Lugd. Bat. I, 161.

Nicobar Islands. Distrib. Peninsular India, Ceylon, Malayan Archipelago, Philippines, China.

2. SALOMONIA, Lour.

Leafy diffuse annuals, or (Sect. *Epirhizanthos*) parasites with leaves reduced to scales. *Flowers* minute, in dense terminal spikes. *Sepals* nearly equal, 2 interior somewhat larger. *Petals* 3, united at the base with the staminal tube; the inferior keel-shaped, galeate, not crested.

Stamens 4-5, filaments united for their lower half into a sheath; anthers opening by pores. *Ovary* 2-celled, each cell with one pendulous ovule: *Capsule* much compressed laterally, 2-celled, loculicidal, margins toothed. *Seeds* albuminous, not or scarcely strophiolate. Distrib. Species about 8, natives of Eastern tropical Asia and tropical Australia.

Sect. I. SALOMONIA, DC. Stems leafy.

1. SALOMONIA CANTONIENSIS, Lour. Fl. Coch. Ch. 14. A diffuse, much-branched, glabrous, annual; stem and branches winged. *Leaves* shortly petiolate, ovate-cordate, 3-nerved, length .25 to .4 in. *Spikes* numerous, terminal, dense above but lax below, 1-3 in. long; bracts minute, fugacious. *Flowers* .05 in. long. *Sepals* linear. *Capsule* flat, reniform, its edges with bold recurved triangular teeth. *Seeds* black, estrophiolate; Hook. fil. Fl. Br. Ind. I, 206. DC. Prod. I, 334; Benth. Fl. Hongk. 44; Miq. Flor. Ind. Bat. I, pt. ii, 127; Hassk. in Miq. Ann. Mus. Lugd. Bat. I, 144. *S. subrotunda*, Hassk. l. c. 146.

In all the provinces except Nicobars and Andamans; in swampy places. Distrib. Brit. India, Malayan Archipelago.

2. SALOMONIA OBLONGIFOLIA, DC. Prod. I, 354. An erect, simple or little-branched, glabrous annual, 3-6 in. high: stem and branches very slightly winged. *Leaves* elliptic or ovate-lanceolate, sessile, .15 to .4 in. long. *Bracts* linear, often persistent. *Spikes* terminal, 1-3 in. long, naked below. *Flowers* crowded above, .05 in. long. *Sepals* nearly equal, lanceolate. *Capsule* reniform, teeth pointed, spreading. *Seeds* black, estrophiolate. Hook. fil. Fl. Br. Ind. I, 207; Hassk. in Miq. Ann. Mus. Lugd. Bat. I, 147; Arn. Pug. Ind. IV; Deless. Ic. Sel. III, t. 19. *S. sessiliflora*, Ham. in Don Prodr. 201. *S. obovata*, Wight Ill. i, t. 22 B. *S. canarana*, *rigida*, ? *Horneri*, ? *uncinata* and ? *setosa-ciliata*, Hassk. l. c. 147, 148, 149 ? *S. stricta*, Sieb. et Zucc. Abh. d. k. Baier. Akad. d. Wiss. IV, 2, 152.

In all the provinces except Nicobars and Andamans, in swampy places. Distrib. Brit. India, Malayan Archipelago.

Sect. II. EPIRHIZANTHES, Blume (genus). Parasitic leaves none, or reduced to scales.

3. SALOMONIA APHYLLA, Griff. in Trans. Linn. Soc. xix, 342. A brownish-purple, erect, little-branching, parasitic herb, 3-6 in. high. *Leaves* reduced to a few distant, brown scales. *Spikes* terminal, dense, 1-3 in. long. *Bracts* minute, persistent. *Flowers* pale brown, .04 in. long. *Sepals* ovate. *Capsule* transversely ovate, with a single apical tooth. *Seeds* black, strophiolate, Hook. fil. Fl. Br. Ind. I, 207. *S. parasitica*, Griff. Notul. IV, 538. *S. tenella*, Hook. fil. in Trans. Linn. Soc. xxiii. 158. *Epirhizanthos*, Bl. Cat. Hort. Buitenz. and in Flor. Bot. Zeit. 1825, p. 133; Reuter in DC. Prod. XI, p. 44.

Perak; in dense Bamboo Forests. Distrib. Java, Borneo, Tenasserim.

3. SECURIDACA, Linn.

Shrubs, almost always scandent. *Flowers* in terminal or axillary, usually compound, racemes. *Sepals* deciduous, 2 inner (*wings*) larger and petaloid. *Petals* 3, lateral nearly or quite distinct from the galeate crested keel, superior petals 0. *Stamens* 8, filaments united: anthers 2-celled, dehiscing by oblique pores. *Ovary* 1-celled, 1-ovuled. *Fruit* a 1-celled samara, 1-seeded; wing broad, coriaceous. *Seeds* exalbuminous, estrophiolate. Distrib. Species about 25; most numerous in tropical America, rarer in tropical Africa and Asia.

SECURIDACA BRACTEATA, Benn. in Hook. fil. Fl. Br. Ind. I, 208. A powerful climber; branches terete, puberulous. *Leaves* elliptic, shortly and bluntly acuminate, the margins revolute when dry, base rounded or slightly narrowed; upper surface shining, lower densely covered with minute pale pubescence; nerves 5-6 pairs. *Flowers* in racemes or panicles; bracts ovate, acuminate, pubescent, deciduous. *Outer sepals* nearly equal, small, ovate, very hairy, ciliate; wings large, rotund, pubescent externally. *Lateral petals* truncate; keel with a recurved, plaited crest. *Ovary* orbicular; style curved. *Stigma* large. *Samara* 3-3½ in., the nucleus smooth, sub-globular, ¼ in. in diam.; the wing obliquely oblanceolate, membranous, with prominent transverse curving arched nerves; the upper edge thickened entire, the lower erose.

Malacca, Maingay; Perak, Wray.

Not having seen any specimen with perfect flowers, I have copied the description of the sepals and petals from Bennet.

4. TRIGONIASTRUM, Miquel.

A shrub or small tree. *Leaves* hoary beneath. *Flowers* in slender terminal panicles. *Sepals* 5, nearly equal, the two outer larger. *Petals* 5, imbricate, unequal, the two lower partially united to form a keel; the odd petal the largest, saecate at the base and with a large hairy gland in its concavity. *Stamens* 5 or 6, the filaments united into a group between the ovary and the keel. *Ovary* densely hairy, 3-locular; ovules pendulous, solitary in each cell. *Fruit* of 3 samaroid, ultimately almost distinct, carpels. *Seeds* 1 in each carpel, not strophiolate.

TRIGONIASTRUM HYPOLEUCUM, Miq. Fl. Ind. Bat. Suppl. I, 395. A slender tree, 30 to 60 feet high; young branches hoary-pubescent; the older with dark brown, lenticellate bark. *Leaves* elliptic-lanceolate, shortly and bluntly acuminate, narrowed to the base; both surfaces shining; the upper glabrous; the lower pale, very minutely scurfy-pubescent,

the reticulations and 6 pairs of nerves bold and prominent; length 4 to 5 in., breadth 1·25 to 1·75 in.; petiole ·2 to ·3 in. *Panicles* axillary and terminal, slender, spreading. *Flowers* ·25 in. in diam.; shortly pedicellate. *Sepals* 5, pubescent, slightly unequal. *Ovary* hairy. *Samaras* 2 in. long; the nucleus 1 in. to 1·25 long, triangular, flat; the wing thinly membranous, pale yellow, oblong, its apex blunt, oblique, venation vertical, the areolae wide. *Isopteris penangiana*, Wall. Cat. 7261.

Penang. Malacca. Perak; common.

The pubescence on the under surfaces of the leaves is so minute that, without a good lens, it is not seen.

5. XANTHOPHYLLUM, Roxb.

Trees or shrubs. *Leaves* coriaceous or sub-coriaceous, usually yellowish green. *Sepals* 5, nearly equal. *Petals* 5 or 4, the inferior keeled, not crested. *Stamens* 8, distinct, 2 attached to the base of petals, the others hypogynous. *Ovary* often surrounded by a hypogynous disc, stipitate, 1-celled; style more or less filiform, ovules various in insertion and number. *Fruit* 1-celled, 1-seeded, indehiscent. *Seeds* exalbuminous, estrophiolate. Distrib. Species about 27, mostly Malayan, a few Indian and one in Queensland.

Ovules 4.

Leaves membranous or sub-coriaceous (coriaceous in No. 2) small: flowers less than ·4 in. long.

Fruit not verrucose.

Ovary glabrous, fruit shining ... 1. *Andamanicum*.

Ovary tomentose

Nerves of leaves 3 to 4, young

fruit tomentose ... 2. *Griffithii*.

Nerves of leaves 4 to 5, fruit tomentose, branches very slender ...

3. *Maingayi*.

Fruit verrucose.

Fruit verrucose only when ripe, glabrous; leaf-nerves 9 to 10 pairs ...

4. *glaucum*.

Fruit verrucose from its youngest state.

Nerves of leaves 4 to 5, ovary vil-

lous; fruit glabrous, vertically

grooved ...

5. *Palembanicum*.

Nerves of leaves 4 to 5; ovary vil-

lous, fruit puberulous not verti-

cally grooved ...

6. *eurhynchum*.

Nerves of leaves 10 to 13; ovary
villous, ripe fruit glabrous not
vertically grooved ... 7. *Wrayi*.

Leaves coriaceous, shining on both surfaces;
flowers large, .4 to .6 in. long, (small in
No. 8).

Leaves 3 to 5 in. long, nerves 5 to 6 pairs	8. <i>Curtisii</i> .
„ 4 to 9 in. „ „ 8 to 10 „	9. <i>Kunstleri</i> .
„ 9 to 11 in. „ „ 6 to 8 „	10. <i>Hookerianum</i> .
„ 9 to 14 in. „ „ 14 to 16 pairs	11. <i>venosum</i> .

Ovules 6 to 14.

Shrubs or trees with glabrous leaves.

Leaves shining on both surfaces, drying
brown. Flowers large, in short racemes.

Ovary cottony ... 12. *stipitatum*.

Ovary glabrous.

Leaves 2 to 2.25 in. long, nerves 3 pairs 13. *Scortechinii*.

„ 2.5 to 4 in., nerves 5 to 6 pairs... 14. *ellipticum*.

„ 4 to 6 in., nerves 5 to 6 pairs... 15. *obscurum*.

Leaves dull white below, not shining, green-
ish above when dry: flowers large, ovary
tomentose ... 16. *pulchrum*.

Leaves shining on both surfaces, drying yel-
lowish or greenish.

Leaves not cordate; panicles small,
not spreading ... 17. *affine*.

Leaves minutely cordate at base; pa-
nicles large, wide-spreading ... 18. *bullatum*.

*Trees with leaves pubescent beneath, and tomentose
inflorescence.*

Pubescence sulphureous; ovary glabrous... 19. *sulphuratum*.

„ rufous; ovary tomentose ... 20. *rufum*.

Doubtful species.

Fruit many-seeded 3 in. in diam. ... 21. *insigne*.

1. *XANTHOPHYLLUM ANDAMANICUM*, King, n. sp. A tree 20 to 30 feet
high, glabrous except the inflorescence, branches dark brown. *Leaves*
thinly coriaceous, drying a pale greenish passing into brown, elliptic to
elliptic-oblong, rarely sub-obovate, sub-acute, the base cuneate; upper sur-
face smooth, shining; the lower dull, pale, minutely reticulate; main nerves
7 to 8 pairs, rather prominent: length 3 to 4 in., breadth 1.25 to 1.75
in.; petiole .3 to .4 in. *Flowers* .3 in. long, their pedicels about as long.
Panicles extra-axillary or terminal, 1.5 to 3 in. long, lax, few-branched,

slender. *Sepals* rotund, pubescent, edges ciliate. *Petals* broadly ovate, glabrous, keel pubescent. *Filaments* flat and pubescent at the base, otherwise glabrous. *Ovary* ovoid-elongate, glabrous, 4-ovuled; style rather flat, pubescent; disc small, glabrous. *Fruit* globose, .5 in. in diam., smooth; pericarp thin, crustaceous.

Andaman Islands; Helfer, Kurz, King's Collector. Burmah, Kurz.

This is not unlike *X. Griffithii* in its leaves: but it differs in its glabrous ovary and fruit.

2. *XANTHOPHYLLUM GRIFFITHII*, Hook. fil. Fl. Br. Ind. I, 210. A tree 40 to 50 feet high; glabrous, except the inflorescence and young fruit. Branchlets robust, dark brown, polished, terete. *Leaves* coriaceous, elliptic-lanceolate or lanceolate, acute or acuminate, the edges slightly revolute, the base acute; upper surface dark (when dry) and shining; the lower pale, sub-glaucous, the minute reticulations and 3-4 pairs of main nerves distinct; length 3 to 5 in., breadth 1 to 1.5 in., petiole thick, dark-coloured, .35 in. long. *Flowers* about .35 in. long, in tomentose axillary racemes shorter than the leaves, or in terminal few-branched panicles: pedicels short, stout. *Sepals* broadly ovate, blunt, dark brown, tomentose externally. *Petals* oblong, blunt, glabrous except the pubescent keel. Lower half of *filaments* thickened, hairy. *Ovary* sessile, tomentose, with 4 ovules from its base. *Style* cylindric, sparsely pilose. *Fruit* (young), globular, tawny-tomentose.

Malacca and Perak. Distrib. Burmah (at Mergui). Ripe fruit of this is unknown.

3. *XANTHOPHYLLUM MAINGAYI*, Hook. fil. in Fl. Br. Ind. I, 210. A tree 20 to 40 feet high. Branches very slender with pale brown bark, the youngest puberulous. *Leaves* membranous, lanceolate or elliptic-lanceolate, cordate-acuminate, the base narrowed; both surfaces smooth, the lower pale but not glaucous; nerves 4-5 pairs, the reticulations fine, not prominent: length 2 to 3 in., breadth .65 in. to 1 in.; petiole slender, about .25 in. *Racemes* axillary and terminal, sometimes branched, the rachises tawny-tomentose, 2 to 3 in. long; flowers white, .35 in. long. *Sepals* rhomboid, unequal, pubescent. *Petals* much longer than the sepals, spreading, glabrous except the pubescent keel. *Filaments* much curved, with a hairy thickening above the base. *Ovary* shortly stipitate, ovoid, ridged, tawny-tomentose; ovules 4, parietal. *Fruit* globose, .5 in. in diam., minutely tomentose; pericarp moderately thick, puckering when dry.

Penang, Malacca and Perak; at low elevations.

4. *XANTHOPHYLLUM GLAUCUM*, Wall. Cat. 4199. A tree 20 to 30 feet high. Young branches terete, smooth, pale, the very youngest brown and slightly angled. *Leaves* sub-coriaceous, oblong-lanceolate to

elliptic-lanceolate, sub-aeute, the base narrowed into the petiole; upper surface shining; lower dull, sub-glaucous; nerves 8 to 10 pairs, not prominent, reticulations minute; length 3 to 4 in., breadth 1 in. to 1·4 in.; petiole rather thick, less than ·25 in. *Flowers* ·25 in. long, otherwise as in *X. Griffithii*. Fruit globose when quite ripe, slightly warted, and 1 in. in diam. Hook. fil. Fl. Br. Ind. I, 209; Hassk. in. Miq. Ann. Mus. Lugd. Bat. I, 193.

Trang. King's Collector No. 1427. Distrib. Chittagong, Burmah.

This differs from *X. Griffithii* chiefly by having many more nerves in its leaves.

5. *XANTHOPHYLLUM PALEMBANICUM*, Miq. Ann. Mus. Lugd. Bat. I, 317. A glabrous tree 30 to 40 feet high; branchlets slender, pale. *Leaves* membranous, drying pale green, lanceolate, rarely elliptic, caudate-aeminate, the base narrowed; aeute or cuneate; upper surface shining, the lower dull, pale but not glaucous, main nerves 4 to 5 pairs, slightly prominent, reticulations minute; length 3 to 4·5 in., breadth 1·1 to 1·3 in.; petiole ·2 in., slender. *Flowers* ·4 in. *Racemes* axillary, few-flowered, slender, shorter than the leaves. *Sepals* unequal, rhomboid, spreading, flat, puberulous externally. *Petals* spathulate, glabrous except the pubescent keel. *Filaments* thickened and pubescent in the lower half. *Ovary* shortly stipitate, villous; the annular disc surrounding it small; style sparsely villous. *Ovules* 4, from near base of ovary. *Fruit* globose, ·75 in. in diam., glabrous, boldly verrucose and with several irregular vertical grooves; pericarp ·1 in. thick, crustaceous.

Perak, rather common. Distrib. Sumatra.

This is not unlike *X. Maingayi*, but is at once distinguished from that by its deeply grooved fruit.

6. *XANTHOPHYLLUM EURHYNCHUM*, Miq. Ann. Mus. Lugd. Bat. I, 277. A glabrous tree 30 to 50 feet high; branchlets terete, brown. *Leaves* drying pale green, sub-ecoriaceous, elliptic-lanceolate tapering at both ends, to elliptic with rounded base and apex shortly aeminate; both surfaces smooth, the upper shining, the lower dull slightly paler; main nerves 4 to 5 pairs, prominent beneath; length 4 to 5·5 in., breadth 1·75 to 2·5 in., petiole ·3 in. *Flowers* ·25 in. long, the pedicels not longer than the calyx. *Racemes* shorter than the leaves, pubescent, axillary and solitary or in terminal few-branched panicles. *Sepals* unequal, ovate-oblong, blunt, spreading, minutely tomentose externally. *Petals* spathulate, glabrous except the pubescent keel. *Filaments* slightly flattened and pubescent in the lower half. *Ovary* villous, 4-ovuled. *Style* slightly curved, villous. *Fruit* globose, ·75 in. in diam., puberulous, rather minutely verrucose, not vertically ridged; pericarp crustaceous, brittle, ·2 in. thick.

Perak, Pangkore. Distrib. Sumatra.

This comes very near *X. Palembangicum*, but is distinguished from that species by its more robust branches, longer leaves, and velvety fruit which is not vertically ridged. The two are, however, closely allied.

7. *XANTHOPHYLLUM WRAYI*, King, n. sp. A shrub 3 to 8 feet high, the young branches puberulous. *Leaves* sub-coriaceous, drying a pale yellowish green, elliptic to oblong, more or less acuminate, the base rounded or narrowed; upper surface shining; lower slightly dull, pale and rather minutely reticulate; the main nerves 10 to 13 pairs, prominent, forming arches .2 in. within the edge; length 6 to 10 in., breadth 2.25 to 4.5 in. petiole .3 to .6 in. *Flowers* .35 in. long, their pedicels shorter than the calyx, in terminal or axillary racemes or small panicles less than a third of the length of the leaves. *Sepals* ovate, blunt, puberulous. *Petals* oblong, obtuse, puberulous in the upper, pubescent in the lower, half. *Filaments* flat, pubescent. *Ovary* on a glabrous stalk, densely villous, 4-ovuled, the disc glabrous. *Fruit* globose, .75 in. in diam.; when young sericeous, when ripe quite glabrous and boldly verrucose.

Penang, Curtis; No. 677. Perak, King's Collector, Wray.

This is not unlike *X. affine*, Korth, but is distinguished from that species by its sericeous ovary and deeply warted fruit. In its fruit this resembles *X. Palembangicum* and *euryuchum*; but it differs from both in its much larger and more numerous veined leaves.

8. *XANTHOPHYLLUM CURTISII*, King, n. sp. A glabrous tree, 30 to 50 feet high. Young branches rather robust, dark brown, glabrous. *Leaves* coriaceous, drying brown, ovate-lanceolate, shortly acuminate, the base rounded or cuneate; both surfaces smooth, dull; the lower paler, minutely reticulate; main nerves 5 to 6 pairs, not much more prominent than the secondary nerves; length 3 to 5 in., breadth 1 to 1.3 in., petiole .4 in. *Flowers* .4 in. long, the pedicels about as long as the calyx. *Panicles* axillary or terminal, few-branched, nearly as long as the leaves. *Sepals* nearly equal, rotund, tomentose. *Petals* oblong, obtuse, glabrous except the broadly obovate pubescent keel. *Filaments* with an ovoid pubescent swelling near the base. *Ovary* sessile, ridged, pubescent, 2 to 4-ovuled, thick walled, surrounded by a fleshy glabrous slightly angled but not wavy disc. *Style* conical, pubescent. *Fruit* (very young) globose, tomentose.

Penang, Curtis; No. 1591 Singapore, Murton.

The leaves of this dry of an olivaceous brown colour.

Ripe fruit is unknown. Curtis' No. 1486 from Penang, of which I have seen no very complete specimen, is probably a variety of this with leaves more attenuated to both base and apex, and with longer more spreading panicles.

9. *XANTHOPHYLLUM KUNSTLERI*, King, n. sp. A glabrous tree 50 to 80 feet high; the branchlets robust, dark brown, sub-glaucous. *Leaves* large, coriaceous (with a yellowish green tinge when dry) elliptic to elliptic-oblong, the apex very shortly and rather suddenly acuminate, the edges (when dry) undulate, the base rounded or slightly narrowed to the stout petiole; both surfaces shining; nerves sub-horizontal, 8 to 10 pairs, prominent beneath as are the secondary nerves and reticulations; length 4·5 to 9 in., breadth 2·25 to 4·25 in., petiole ·6 to ·75 in. *Flowers* ·6 in. long, shortly pedicellate, in axillary racemes less than half as long as, or in terminal few-branched spreading panicles longer than, the leaves. *Sepals* slightly unequal, ovate-rotund, fleshy, thickened along the midrib, minutely tomentose on both surfaces; the edges thin, ciliate. *Petals* oblong-obtuse, glabrous except the pubescent keel. *Filaments* with a pubescent ovoid swelling above the base. *Ovary* almost sessile, surrounded by a shallow wavy fleshy disc, ovoid, grooved, tomentose, 4-ovulate; style conical, slightly curved, pubescent. *Fruit* globose, ·65 in. in diam. (young) deciduously tomentose; pericarp thick, spongy, the calyx persistent.

Perak. At low elevations, not common. King's Collector (Kunstler). Penang, Government Hill, Curtis, No. 1590.

10 *XANTHOPHYLLUM HOOKERIANUM*, King, n. sp. A glabrous large-leaved shrub; young branches rather stout, sub-glaucous. *Leaves* coriaceous, (drying yellowish) elliptic-oblong with a rather abrupt bluntish acumen 1 in. long, the edges slightly revolute when dry, the base slightly narrowed to the petiole; both surfaces smooth, the lower slightly paler; main nerves 6 to 8 pairs, thin but rather prominent beneath as are the reticulations; length 9 to 11 in., breadth 3 to 4 in.; petiole ·75 in. *Flowers* ·4 in. long, the pedicels about as long as the calyx. *Sepals* nearly equal, broadly ovate, minutely tomentose on both surfaces, the edges thin, ciliate. *Petals* oblong, obtuse, glabrous except the pubescent keel. *Filaments* flat, puberulous. *Ovary* sessile, ovoid, tomentose, 4-ovuled; style flat, grooved, pubescent, slightly curved. *Fruit* unknown.

Perak, King's Collector; No. 5997.

11. *XANTHOPHYLLUM VENOSUM*, King, n. sp. A glabrous long-leaved tree 20 to 30 feet high; young branches rather robust, with very dark brown bark. *Leaves* (drying pale yellowish-green), coriaceous, oblong, sub-acute, the edges recurved when dry, gradually but slightly narrowed in the lower fourth to the rounded or minutely cordate base; both surfaces shining, the lower slightly paler; main nerves 14 to 16 pairs, horizontal near the base, sub-ascending towards the apex, prominent on the lower surface and forming bold arches ·2 in. from the margin,

secondary nerves and minute reticulations distinct; length 9 to 14 in., breadth 2·5 to 3·25 in., petiole ·75 to 1 in. *Flowers* 4 in. long, their pedicels longer than the calyx. *Panicles* axillary, few-branched, 3 to 6 in. long. *Sepals* nearly equal, broadly ovate, fleshy with thin edges, puberulous. *Petals* oblong, obtuse, glabrescent, the keel pubescent. *Filaments* flat, puberulous. *Ovary* surrounded by a shallow glabrous wavy disk, ovoid, minutely tomentose, grooved, 4-ovuled; style pubescent, slightly curved. *Fruit* globose with a conical apex, deeply rugose, verrucose; diam., ·35 in. (young).

Perak, King's Collector; Nos. 10614 and 10804.

Ripe fruit of this is unknown. This species, in leaf characters, approaches the Bornean *X. cordatum*, Korth.; but the fruit of that is smooth; of this the fruit is deeply corrugated-rugose as in *X. Palembangicum* and *eurhynchum*.

12. *XANTHOPHYLLUM STIPITATUM*, A. W. Benn. in Hook. Fl. Br. Ind. T. 210. A tree with slender, smooth, brown branches. *Leaves* subcoriaceous, ovate or elliptic, shortly and obtusely caudate-acuminate; upper surface dull, the nerves obsolete; lower shining, the 3 to 4 pairs of nerves indistinct; length 1·75 to 2·25 in., breadth ·75 to 1 in., petiole ·15 in. *Racemes* slender, axillary, longer than the leaves, pubescent. *Flowers* 4 in. long, shorter than their slender pedicels. *Sepals* subequal, oblong, obtuse, glabrescent. *Petals* twice as long as sepals, spatulate, oblong. *Filaments* thickened and hairy in their lower half. *Ovary* stipitate, cottony; style sparsely hairy; ovules 8 to 10.

Malacca.

Hitherto known only by specimens from Malacca; fruit not collected.

13. *XANTHOPHYLLUM SCORTECHINII*, King, n. sp. A tall glabrous tree. *Leaves* thinly coriaceous, drying brown, ovate, obtusely acuminate, the base slightly cuneate, shining on both surfaces; nerves 3 pairs, suberect, not prominent; length 2 to 2·25 in., breadth 1 in., petiole ·35 in. *Flowers* handsome, 6 in. long, their pedicels ·35 in. *Racemes* axillary, solitary, 2 in. long, few-flowered. *Sepals* fleshy, glabrous with ciliolate edges; the three outer ovate blunt, the two inner rotund. *Petals* broadly obovate, clawed, glabrescent, the keel pubescent. *Filaments* as long as the petals, flat, pubescent; anthers short, ovate. *Ovary* shortly stalked, elongated-ovoid, ridged, glabrous, 6-ovuled; style little curved, glabrous; stigma capitate: disc small, annular, glabrous.

Perak, Father Scortechini, No. 2079.

Of this distinct and handsome species fruit is as yet unknown.

14. *XANTHOPHYLLUM ELLIPTICUM*, Korth. in Miq. Ann. Mus. Lugd. Bat. 1, 276. A glabrous tree 30 to 60 feet high; branchlets slender,

pale. *Leaves* drying pale brown, sub-coriaceous, elliptic-lanceolate to elliptic, shortly and bluntly acuminate, the base narrowed or rounded; above shining; below dull, the reticulations distinct; nerves 5 or 6 pairs; length 2·5 to 4 in., breadth 1·2 to 1·75 in., petiole ·25 in. *Flowers* ·25 in. long. *Racemes* axillary, shorter than the leaves, the pedicels longer than the flowers. *Sepals* ovate, fleshy, glabrous, concave, unequal. *Petals* thin, spathulate, much longer than sepals, glabrescent. *Ovary* glabrous, shortly stipitate; the stalk surrounded by a shallow entire, undulate, annular disc; 10-ovulate; style glabrous. *Fruit* globular, ·5 to ·75 in. in diam., when ripe smooth, pulpy; pericarp thin, leathery. Hook. fil. Fl. Br. Ind. I, 211.

Malacca, Perak.

15. *XANTHOPHYLLUM* *OBSCURUM*, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 211. A large tree; branches stout, glabrous, lenticellate. *Leaves* coriaceous, elliptic, blunt, narrowed in the lower third to the stout petiole, drying to a dark brown; both surfaces shining; the lower slightly paler; main nerves 5 to 6 pairs, thin, rather prominent as are the intermediate nerves; length 4·25 to 4·75 in., breadth 2 to 2·25 in., petiole ·4 in. *Racemes* axillary, 1 to 1·15 in. long, few-flowered. *Flowers* ·6 in. long, the pedicels short. *Sepals* oblong, blunt, the edges ciliate, the 3 outer small. *Petals* glabrous, oblong, sub-spathulate. *Ovary* ovoid, glabrous, ovules 8 to 10; style glabrous.

Singapore; Maingay, Hullett.

Fruit of this is unknown.

16. *XANTHOPHYLLUM* *PULCHRUM*, King, n. sp. A glabrous shrub or small tree, the young branches rather robust, the bark very pale. *Leaves* coriaceous, shortly petiolate, elliptic, acute or very shortly and bluntly acuminate, the edges recurved when dry, base rounded; upper surface shining; lower dull, pale yellow, glaucous, the 5-6 pairs of nerves and the fine reticulations very prominent; length 4 to 8 in., breadth 2·25 to 4 in.; petiole stout, ·2 in. *Flowers* ·6 in. long, on short thick pedicels, in dense, solitary, axillary, rufous-tomentose racemes half as long as the leaves, or less; bracts broadly ovate, concave, deciduous, coloured. *Sepals* nearly equal, ovate-rotund, with fleshy tomentose midribs and thin minutely ciliate edges, coloured. *Petals* oblong, blunt, glabrous except the pubescent keel. *Filaments* rather short, broad, flat, puberulous. *Ovary* ovoid, pointed, tomentose, surrounded by a thin, rather deep, glabrous disc; style glabrescent, slightly curved; ovules 12. *Fruit* globose, ·75 in. in diam., minutely tomentose when ripe, pericarp thin.

Perak: rather common. A handsome bush or treelet with yellowish flowers tinged with pink.

In leaf characters this comes near to the Sumatran *X. vitellinum*, Blume: but the two differ in flower and fruit.

17. *XANTHOPHYLLUM AFFINE*, Korth. in Miq. Ann. Lugd. Bat. I, 271. A shrub or tree; young branches glabrous, pale brown. *Leaves* thinly coriaceous (drying of a more or less yellowish pale green, especially beneath), elliptic to oblong-lanceolate, shortly and bluntly acuminate, the base cuneate; upper surface smooth, shining, lower dull pale and yellowish; main nerves 5 to 8 pairs, ascending, prominent beneath; length 4 to 7 in., breadth 1·8 to 2·5 in., petiole ·3 to ·4 in. *Flowers* ·35 in. long, the pedicels nearly as long. *Panicles* axillary or terminal, few-branched, minutely tomentose, the axillary half as long, the terminal as long as, the leaves. *Sepals* un-equal, ovate-rotund to rotund, blunt, tomentose externally. *Petals* oblong, obtuse, pubescent near the base or wholly glabrous, the keel always pubescent. *Filaments* flat, puberulous. *Ovary* shortly stipitate, glabrous, from 8 to 14-ovuled. *Style* short, flat, pubescent. *Disc* annular, fleshy, glabrous, often wavy. *Fruit* globose, ·5 to 1·25 in. in diam., smooth; pericarp thin, crustaceous. Hook. fil. Fl. Br. Ind. I, 209.

In all the provinces; common. Distrib. Malayan Archipelago generally. Tenasserim.

This occurs as a bush and also as a tree. It varies a little as to colour and shape of leaves, and as to the pubescence on the petals. But, when its commonness is considered, its characters are really remarkably constant, that of the size of the individual alone excepted.

18. *XANTHOPHYLLUM BULLATUM*, King, n. sp. A shrub or small tree with large, sub-sessile leaves; young branches robust, pale, puberulous, lenticellate. *Leaves* coriaceous, drying a pale greenish-yellow, elliptic-oblong, sub-obovate, shortly and bluntly acuminate, the edges sub-recurved; slightly narrowed to the cordate, sub-auriculate, slightly unequal base; bullate, especially in the lower half, shining and glabrous on both surfaces, the lower a little paler; main nerves 18 to 25, bold on lower surface and sometimes puberulous as in the strong midrib; length 11 to 18 in., breadth 4 to 6·5 in.; petiole ·25 in., very stout, glandular. *Flowers* ·4 in. long, the pedicels twice as long as the calyx. *Panicles* terminal, many-branched, spreading, pubescent; bracts deciduous, ovate. *Sepals* unequal, rotund, fleshy, concave, tomentose, the edges of the inner two thin and ciliate. *Petals* ovate-rotund, glabrous, not much larger than the sepals. *Filaments* flat, fleshy, glabrous. *Ovary* glabrous, ovoid, 8-ovuled, surrounded by a glabrous fleshy annular wavy disc; style glabrous; stigma conical, pubescent. *Fruit* globose, glabrous, ·75 in. in diam. (? ripe;); pericarp thick, crustaceous.

Perak, on low Hills.

This resembles *X. adenotus*, Miq., but differs in venation of leaves and in inflorescence.

19. *XANTHOPHYLLUM SULPHUREUM*, King, n. sp. A tree 100 (or even 150) feet high; branches with very dark brown bark, the youngest minutely tomentose. *Leaves* coriaceous, drying bright yellowish-green, elliptic-oblong, sometimes sub-obovate, acuminate, the edges recurved when dry, the base cuneate; upper surface glabrous, shining; lower sulphureous, softly but minutely pubescent especially on the midrib and 6 to 7 pairs of prominent ascending nerves; length 5·5 to 7·5 in., breadth 2 to 2·5 in., petiole ·5 to ·65 in. *Flowers* ·4 in. long, the pedicels about as long as the calyx. *Panicles* tomentose, with ovate deciduous bracts, compact, many-branched, axillary or terminal, less than half the length of the leaves. *Sepals* unequal, ovate-rotund, minutely tomentose on both surfaces, the edges ciliolate. *Petals* oblong, obtuse, glabrous except the pubescent tips; the keel obovate, vertically 9 to 10-ridged, tomentose. *Filaments* flattened, glabrous. *Ovary* shortly stipitate, glabrous, ovate, 8-ovuled, surrounded at the base by a fleshy glabrous much waved annular disc. *Style* villous in its lower, glabrous in its upper, half. *Fruit* (young) globose, sulphureous, glabrous, faintly rugose.

Perak, on low hills.

Not unlike *X. rufum*, A. W. Benn. in general aspect: but with smaller flowers, glabrous ovary and fruit, and leaves intensely sulphureous beneath.

20. *XANTHOPHYLLUM RUFUM*, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 210. A tree 40 to 50 feet high. Branchlets stout, terete, pale scurfy-pubescent, the youngest rufous-tomentose. *Leaves* coriaceous, elliptic to ovate or obovate-elliptic, very shortly and suddenly acuminate, narrowed in the lower third to the stout short petiole, the edges recurved when dry; upper surface glabrous, dull; lower paler, covered with short soft pubescence especially on the midrib and 7-8 pairs of bold semi-erect nerves; length 4·5 to 6·5 in. (acumen ·5 in.,) breadth 2·25 to 2·75 in., petiole ·5 in. *Panicles* terminal or from the axils of the uppermost leaves, lax, few-branched, 3 to 7 in. long, densely tomentose, the ends of the branches and sepals rufous. *Flowers* ·6 in. long, on short pedicels in the axils of ovate sub-persistent bracts. *Sepals* unequal, ovate to sub-reniform, densely tomentose on both surfaces, fleshy, concave. *Petals* more than twice as long as the sepals, oblong, obtuse, glabrous except the tomentose keel. *Filaments* glabrous, flat at the base. *Ovary* surrounded by a shallow fleshy disc, sessile, ovate, pointed, ridged, tomentose as is also the conical style; ovules 12 to 16. *Fruit* ·75 in. in diam., (? mature) globose, with 4 vertical rufous pubescent ridges; pericarp thick, crustaceous,

Malacca; Perak. Distrib. Sumatra. (Beccari, P. S. No. 643.)

21. *XANTHOPHYLLUM INSIGNE*, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 211. A glabrous tree with pale branchlets. *Leaves* drying brown, coriaceous, elliptic, obtuse, the base slightly narrowed; upper surface shining; lower dull, pale, the 6-8 pairs of nerves and rather wide reticulations prominent; length 4.5 to 6.5 in., breadth 3 to 3.5 in.; petiole stout, .6 in. Racemes 3 to 4 in. long, axillary, sometimes terminal and paniced. *Flowers* .6 to .75 in. long; *sepals* unequal, sub-orbicular, puberulous. *Petals* spatulate, glabrous except the pubescent claw; keel adpressed-sericeous, its claw pubescent. *Stamens* 8, the filaments flat at the base and rising from an annular entire undulate disc which surrounds the ovary. *Ovary* ovoid, ridged, glabrous, ovules 16; style little curved, glabrous. *Fruit* globose, 3 in. in diam., minutely rugose, pericarp .5 in., thick; seeds oblong, 1 in. long, embedded in pulp.

Malacca; Maingay, No. 348. Miller.

ORDER XII. PORTULACÆ.

Herbs, rarely undershrubs. *Leaves* opposite or alternate, entire; nodes with scarious or hairy appendages, rarely naked. *Inflorescence* various. *Sepals* 2, imbricate. *Petals* 4-5, hypogynous or perigynous, free (or united below), fugacious. *Stamens* 4-∞, inserted with (rarely upon) the petals, filaments slender; anthers 2-celled. *Ovary* free, or $\frac{1}{2}$ -inferior, 1-celled; style 2-8-fid, divisions stigmatose; ovules 2-∞, on basal funicles or a central column, amphitropal. *Capsule* with transverse or 2-3-valvular dehiscence. *Seeds* 1-∞, compressed; embryo curved round a mealy albumen. Distrib. Cosmopolitan, chiefly American: genera 15, species about 125.

1. PORTULACA, Linn.

Diffuse, usually succulent, annual or perennial herbs. *Leaves* with scaly or hairy nodal appendages. *Flowers* terminal, surrounded by a whorl of leaves, solitary or clustered. *Sepals* connate below, the free part deciduous. *Petals* 4-6, perigynous or epipetalous. *Ovary* $\frac{1}{2}$ -inferior; style 3-8-fid; ovules ∞. *Capsule* crustaceous, dehiscing transversely. *Seeds* ∞, reniform. Distrib. Tropical regions, chiefly American; one or two are cosmopolitan weeds extending to temperate regions; species 16.

1. *PORTULACA OLERACEA*, Linn. An annual glabrous, sub-succulent, prostrate herb, 6 to 12 inches long; sometimes with minute scarious appendages at the nodes. *Leaves* flat, cuneate-oblong, rounded or truncate at the apex, .25 to 1.25 in. long; petiole very short. *Flowers* in few-flowered terminal heads or in dichotomous cymes, sessile, surrounded

by a few ovate, pointed scarious bracts: *petals* 5, equal to the sepals, yellow: *stamens* 8 to 12: *style* 3-8-cleft: *seeds* punctate: Roxb. Fl. Ind. II, 463; W. & A. Prodr. 356. *P. laevis*, Ham. in Wall. Cat. 6841. Hook. fil. Fl. Br. Ind. I, 246. *P. suffruticosa*, Thw. Enum. 24 (not of Wight).

In the Andamans, and probably in all the Provinces, in waste places. Distrib. All warm climates.

2. *PORTULACA QUADRIFIDA*, Linn. An annual with diffuse filiform stems, rooting at the nodes; nodal appendages copious, pilose. *Leaves* flat, opposite, ovate or ovate-lanceolate, acute, almost sessile; length .2 to .35 in. *Flowers* solitary, terminal; calyx tube partly immersed in the extremity of the axis, surrounded by long silky hairs and by about 4 bracteoles: *petals* 4, yellow; *stamens* 8 to 12; *style* filiform, deeply 4-fid. *Seeds* minutely tuberculate. DC. Prod. III, 354. Wight Ill. ii, t. 109. Hook. fil. Fl. Br. Ind. I, 247. Oliver Fl. Trop. Africa, I, 149. *P. meridiana*, L. Roxb., Fl. Ind. II, 463. *P. geniculata*, Royle Ill. 221. *P. anceps*, Rich. Fl. Abyssin., I, 301.

Penang, in the Fort; Curtis. Distrib. Throughout the Tropics of Asia, S. Africa.

ORDER XIII. HYPERICINEÆ.

Herbs or shrubs, rarely trees. *Leaves* opposite, often punctate with pellucid glands or dark glandular dots, entire or glandular-toothed; stipules 0. *Flowers* solitary or cymose, terminal, rarely axillary. *Sepals* and *petals* each 5, rarely 4; petals contorted in bud. *Stamens* indefinite, or rarely definite, 3- or 5-adelphous, rarely free or all connate; anthers versatile. *Ovary* 3- 5-carpellary, 1- or 3-5-celled; styles as many, filiform, free or united; ovules few or numerous, on parietal or axile placentas, anatropous, raphe lateral or superior. *Fruit* capsular or baccate. *Seeds* exalbuminous, sometimes winged; embryo straight or curved. Distrib. Temp. countries and mountains of warm regions; genera 8, species about 210.

1. *CRATOXYLON*, Blume.

Shrubs or trees. *Leaves* entire, usually papery. *Inflorescence* axillary or terminal, cymose. *Sepals* and *petals* each 5, *Stamens* 3- or 5-adelphous, with fleshy hypogynous glands alternating with the bundles. *Ovary* 3-celled; styles distinct; ovules 4-8 in each cell. *Capsule* 3-valved, seeds winged. Distrib. Tropical Asia; species about 12.

Sect. I. *ANCISTROLOBUS*, Spach. *Petals* sub-persistent, inappendiculate. *Stamens* 3-delphous; glands more or less cucullate.

1. *CRATOXYLON POLYANTHUM*, Korth. Verhand. Nat. Gesch. Bot. 175, t. 36. A large shrub, or tree 30 to 40 feet high, all parts glabrous;

young branches pale brown, compressed. *Leaves* membranous, minutely pellucid-punctate, elliptic-oblong, almost equally acute at base and apex; above shining, below rather dull; nerves about 7 to 10 pairs, pale; reticulations minute; length 1·5 to 3·5 in., breadth ·75 in. to 1·25 in., petiole ·1 in. *Flowers* slightly supra-axillary, solitary or in 1 to 3-flowered cymes, ·5 in. in diam. *Sepals* elliptic, obtuse, as long as the petals. *Petals* oblanceolate, veined. *Hypogynous glands* large, fleshy. *Capsule* slightly exceeding the persistent sepals. *Seeds* obliquely winged. Hook. fil. Fl. Br. Ind. I, 257. Miq. Fl. Ind. Bat. I, pt. ii, p. 516.

All the Provinces. Distrib. British India, China, Philippines.

Var. 1. *LIGUSTRINUM*, Blume Mus. Bot. II, 16 (sp.); leaves narrowed at both ends, acute. *C. lanceolatum*, Miq. Fl. Ind. Bat. Supp. I, 500. *Ancistrolobus ligustrinus*, Spach. Suit. Buff. V, 361. *A. brevipes*, Turcz. Bull. Mosc. 1858, I, 383. *Hypericum pulchellum*, Wall. Cat. 4821. *H. carneum*, Wall. Cat. 4820.

Andamans, Malacca, Penang.

Var. 2. *WIGHTII*, Bl. l. c. 18. (sp.) Leaves broadly oval, mostly obtuse. *Ancistrolobus* sp. Wight Ill. I, 111. *Hypericum horridum*, Wall. Cat. 4822. *Elodea* sp. Griff. Notul. IV, 569.

Perak, King's Collector.

Sect. II. *TRIDESMIS*, Spach. *Petals* not persistent, with a basal squamule. *Stamens* 3- or 5-adelphous.

2. *CRATOXYLON ARBORESCENS*, Blume Mus. Bot. II, 17. A tree 15 to 50 feet high, all parts glabrous. Young branches robust, the bark pale brown, often ridged. *Leaves* coriaceous, broadly oblanceolate, obovate-elliptic or oblong-obovate, very shortly acuminate; dull on both surfaces, the lower pale, yellowish-brown with black dots; nerves numerous, obsolete; length 3 to 4·5 in., breadth 1·25 to 2 in.; petiole ·25 in., stout. *Cymes* in large terminal panicles usually longer than the leaves. *Flowers* ·3 in. in diam. *Sepals* unequal, ovate-rotund, veined. *Petals* about as long as the sepals, broadly cuncate, conspicuously veined and with a lacinate basal scale. *Capsule* longer than the persistent sepals. *Seeds* winged all round. Hook. fil. Fl. Br. Ind. I, 258; Kurz Fl. Burm. I, 84; *C. coccineum*, Planch. *Hypericum arborescens*, Vahl. Symb. II. 86, t. 43. *H. coccineum*, Wall. Cat. 4823. *Ancistrolobus glaucescens*, Turcz. Bull. Mosc. 1858, I, 383. *Vismia?* *arborescens*, Choisy Prod. Hyp. 36.

In all the Provinces. Distrib. Malayan Archipelago: Burmah.

Var. *Miquelii*, branches more slender than in the typical form; leaves thinner in texture, oblanceolate, acuminate. A small tree 15 to 20 feet. *C. cuneatum*, Miq. Fl. Ind. Bat. I, pt. ii, 517.

Penang, Perak. Distrib. Sumatra.

3. *CRATOXYLON FORMOSUM*, Benth. and Hook. fil. Gen. Pl. I, 166 A shrub or tree 20 to 6 feet high, all parts quite glabrous, young branches pale. *Leaves* membranous, broadly elliptic to elliptic-oblong, acute or rounded, the base slightly narrowed; upper surface shining; lower dull pale, glaucescent and with numerous minute black dots; main nerves 6 to 8 pairs, little more prominent than the secondary; length 3 to 4 in., breadth 1.75 to 2.25 in.; petiole .25 in., thin. *Cymes* axillary, or from above the scars of fallen leaves, 2-3 flowered. *Flowers* .75 in. long, their pedicels .5 in. *Sepals* elliptic, pointed, faintly veined, .2 in. long, nearly equal, not accrescent. *Petals* thin, prominently veined, elliptic, with a narrow scale above the slender claw; *Hypogynous glands* small, oblong or quadrate, crimson. Tubes of staminal bundles long, slender, exerted. *Capsules* cylindric, acute, .6 in. long. *Seeds* .3 in. long, with an obtuse obovate unilateral wing. Hook. fil. Fl. Br. Ind. I, 258; Kurz Fl. Burm. I, 84. *Tridesmis formosa*, Korth. Verh. Nat. Gesch. Bot. 179, t. 37; Miq. Fl. Ind. Bat. I, pt. ii, p. 517. *T. ochnoides*, Spach Suit. Buff. V, 359. *Elodea formosa*, Jack in Hook. Journ. Bot. I, 374.

In all the Provinces. Distrib. Siam, Philippines, Malayan Archipelago.

4. *CRATOXYLON MAINGAYI*, Dyer in Hook. fil. Fl. Br. Ind. I, 258. A tree 30 feet high; all parts glabrous: young branches with pale brown, ridged, bark. *Leaves* coriaceous, elliptic, acuminate at apex and base; both surfaces shining, the lower paler; main nerves obscure, about 6 pairs; length 2 to 3.5 in., breadth 1 to 1.5 in., petiole .25 in. *Cymes* axillary, or from above the scars of fallen leaves, few-flowered. *Flowers* about .5 in. long, their pedicels .25 in. *Sepals* oblong, unequal. *Petals* elliptic, clawed, veined, the basal scale acute. *Capsule* .5 in. long, narrowly cylindric. *Seeds* .25 in. long, with oblong unilateral wing.

Penang; Maingay.

Apparently an uncommon tree, since only Maingay has as yet collected it.

ORDER XIV. GUTTIFERÆ.

Trees or shrubs with yellow or greenish juice. *Leaves* opposite, coriaceous or membranous, rarely whorled or stipulate. *Flowers* axillary or terminal, solitary, fascicled, subracemose or panicled, white, yellow or red, regular, diceious, polygamous or hermaphrodite. *Sepals* 2-6, imbricate or in decussate pairs. *Petals* 2-6 (rarely more, or 0), usually much imbricated or contorted. MALE FL.: *Stamens* usually indefinite, hypogynous; filaments free or variously connate, monadelphous or in as many bundles as there are petals; anthers various. FEMALE FL.: *Staminodes* various. *Ovary* 1-2-∞-celled; style slender, short or 0; stigmas

as many as the cells, free or connate, sometimes peltate; ovules 1-2 or ∞ , axile, or erect from the base of the cell. *Fruit* usually baccate and indehiscent. *Seeds* large, albumen 0; embryo consisting of a large radicle (*tigellus*) with small or obsolete cotyledons, or of thick free or consolidated cotyledons with a very short inferior radicle. A large tropical family, common in Asia and America, rare in Africa, of 24 genera and 320 species.

Tribe I. *Garcineæ*. Cells of ovary 1-ovuled; stigma sessile or sub-sessile, peltate, entire or with radiating lobes. Fruit baccate, indehiscent; embryo with cotyledons minute or undistinguishable.

Calyx of 4 or 5 sepals ... 1. *Garcinia*.

Tribe II. *Calophylleæ*. Ovary with 1 to 4 erect ovules: style 1, slender: stigma peltate, 4-fid. Fruit fleshy, usually indehiscent. Embryo with 2 distinct cotyledons.

Ovary 1-celled.

Ovules solitary, style 1, stigma peltate ... 2. *Calophyllum*.

Ovules 4; style 1, 4-fid. with a stigma
above each segment ... 3. *Kayea*.

Ovary 2-celled, 4-ovuled.

Style 1, stigma peltate ... 4. *Mesua*.

1. GARCINIA, Linn.

Trees, usually with yellow juice. *Leaves* evergreen, coriaceous, very rarely stipulate. *Flowers* solitary, fascicled, or paniced; axillary or terminal; polygamous. *Sepals* 4-5, decussate. *Petals* 4-5, imbricate. MALE FL.: *Stamens* ∞ , free, or collected into a ring, or an entire globose or conical 4-5-lobed mass, often surrounding a rudimentary ovary; anthers sessile, or on short thick filaments, 2 rarely 4-celled, adnate or peltate, dehiscing by slits or pores, or circumsciss. FEMALE OR HERMAPHRODITE FL.: *Staminodes* 8- ∞ , free or connate. *Ovary* 2-12-celled; stigma sessile or sub-sessile, peltate, entire or lobed, smooth or tubercled; ovules solitary in each cell, attached to the inner angle of the cell. *Berry* with a coriaceous rind. *Seeds* with a pulpy aril. Distrib. Tropical Asia, Africa, and Polynesia; species about 100.

Subgenus I. GARCINIA proper. Sepals 4, decussate: petals 4, imbricate.

Sect. 1. Stamens of male flower occupying both sides of 4 pedicelled fleshy processes; anthers sessile, 2-celled, the cells more or less orbicular

(4-celled in *cuspidata*) dehiscing longitudinally, the connective thick; rudimentary stigma hemispheric, entire, discoid and flat, or concave (in *Merquensis* and *rostrata*); the style long, cylindric *species 1 to 7.*

Sect. 2. Stamens of male flower in a 4-lobed mass surrounding the rudimentary ovary: anthers 2-celled, oblong, dehiscing longitudinally.

Rudimentary stigma 6 to 8-lobed ... *species 8 to 10.*

Rudimentary stigma none ... *species 11 to 13.*

Sect. 3. Stamens in a single un-lobed mass; anthers 2-celled.

Stamens of male flower in a cone: rudy. stigma large convex ... *14. Malaccensis.*

Staminal receptacle stipitate: anthers broadly oblong, curved, dehiscence longitudinal; rudy. stigma broad, discoid ... *15. Maingayi.*

Stamens in whorls on a thin annular fleshy receptacle ... *16. atro-viridis.*

Stamens of male flower on a flat or convex sessile receptacle.

Anthers bent round the apex of the connective (horse-shoe-shaped) dehiscing along the convexity: rudy. stigma 0

Leaves white beneath ... *17. opaca.*

„ green „ ... *18. calycina.*

Anthers thick, cuneate, with flat broad tops, the connective large, cells dehiscing longitudinally.

Rudy. stigma large, discoid ... *19. costata.*

„ „ none ... *20. Griffithii.*

Anthers with small connective, cells sub-orbicular, dehiscing longitudinally:

rudy. stigma 0 ... *21. Forbesii.*

Anthers with the connective lengthened transversely and bearing at its extremities the small oval anther cells: rudy.

stigma 0 ... *22. Bancana.*

Sect. 4. Anthers 4-celled ... *species 23 to 26.*

Sect. 5. Anther cells surrounding the central connective, often confluent, their dehiscence circumscissile: rudy. stigma 0 ... *species 27 to 30.*

SUB-GENUS II. XANTHOCHYMUS.

Sepals and petals 5, all imbricate ... species 31 to 36.

Subgenus I. GARCINIA proper, sepals 4, decussate: petals 4, imbricate.

1. GARCINIA EUGENIÆFOLIA, Wall. Cat. 4873. A small tree; the young branches thin, 4-angled, rather pale when dry. *Leaves* sub-coriaceous, elliptic, tapering to each end, the apex with a short blunt tail; upper surface shining; the lower dull, pale, opaque; nerves thin, spreading, less than .1 in. apart, very indistinct on either surface; length 2 to 3.5 in., breadth .9 to 1.35 in., petiole .2 to .25 in. *Male flowers* .2 in. in diam., in axillary or terminal, minutely bractcate, 3- to 6-flowered fascicles; pedicels .2 in. long. *Sepals* 4, orbicular, the outer pair small, the inner pair as large as the petals. *Petals* 4, orbicular, thin with a circular thickened coloured fleshy spot near the base: *Stamens* numerous, forming with the rudy. stigma a dense convex mass; *anthers* numerous, on both sides of 4 fleshy processes, orbicular-oblong, 2-celled, the dehiscence vertical: rudy. stigma large, hemispheric, the style cylindric. *Female flower*: .25 in. in diam., in pedunculate 3-flowered cymes, sometimes several from same axil, pedicels .25 to .35 in. *Sepals* 4; the outer pair small, fleshy, ovate-orbicular; the inner pair thin, nearly as large as the petals, slightly keeled at the base; *petals* as in the male: *Staminodes* and disk absent. *Stigma* large, hemispheric, sub-papillose, entire, covering nearly the whole of the ovary. Fruit in fascicles of 2 to 4, globular, .75 in. in diam., smooth, brown, crowned by the papillose stigma; calyx not persistent. Hook. fil. Fl. Br. Ind. I, 268; Pierre Fl. Forest. Coch-Chine, fasc. VI, p. vi, in part; *G. brevirostris*, Scheff. Obs. Phyt. II, 41.

Penang: Wallich, Curtis, No. 669. Tenasserim and Andamans; Helfer, 855. Perak; King's Collector Nos. 8604, 5954, Wray No. 461.

There are two specimens in the Calcutta Herbarium of *G. brevirostris*, Scheffer, named by the author himself; and they agree absolutely with Wallich's No. 4873. This species is quite distinct from Griffith's No. 858 (Kew Dist.) from Malacca, which Pierre not only reduces here, but of which he figures (tab. 90 E. F.) the flowers as the flowers of this. This species does not appear to be a common one. Specimens of other things appear to have been so much confounded with it, that I forbear to quote more synonyms than *G. brevirostris*.

2. GARCINIA MERGUENSIS, Wight Ill. 122, Ic. 116. A tree 30 to 40 feet high; young branches thin, terete, dark brown when dry. *Leaves* ovate-elliptic to lanceolate, bluntly caudate-acuminate, the base cuneate; upper surface when dry shining, dark brown; the lower dull

pale brown, the midrib distinct on both; nerves indistinct, thin, spreading, about .075 in. apart: length 3 to 3.5 in., breadth 1.1 to 1.4 in., petiole .25 in. *Male flowers* .15 in. in diam., in rather dense axillary minutely bracteolate 3- to 6-flowered cymes longer than the petioles: pedicels .2 in., buds globose: *sepals* 4, fleshy, the outer pair small, ovate-orbicular, sub-acute; the inner pair orbicular, all concave; petals 4, orbicular, fleshy, concave, covering the stigma in bud: *anthers* numerous on both sides of 4 fleshy processes, sessile, oblong, dehiscing suturally; rudy. style long, cylindric, thick: stigma discoid, smooth, flat. *Hermaprodite flowers*; *sepals* 4, the outer pair as in the male ovate-orbicular, thin: *petals* 4, orbicular-reniform, fleshy, not covering the stigma: *stamens* numerous on both sides of 4 triangular fleshy processes; *anthers* sessile, sub-orbicular, dehiscing vertically by the sutures: *stigma* sessile, very large, hemispheric, convex, smooth, covering the anthers when young. *Female flowers*; *sepals* 4, the outer pair much smaller than the inner, all thin and concave: *petals* 4, orbicular, about the same size as the inner sepals, concave, thinly coriaceous, with a thickened coloured patch at the base: staminodes and disk 0: *stigma* semi-hemispheric, almost covering the whole ovary. *Fruit* pedicelled, globular, .75 in. in diam., smooth, covered by the concave smooth stigma. Hook. fil. Fl. Br. Ind. I, 267; Kurz Fl. Burm., I, 89: Pierre Flora Forest. Coch-Chin. fasc. VI, p. vi, tab. 68, 69, 91, D.

Malacca; Griffith, Maingay, No. 155, Kew Distrib. Perak; Scortechini Nos. 244a and 812, King's Collector, No. 2660, Wray, 1075. Penang; Curtis, No. 900.

Maingay No. 155 is the type of Pierre's species *G. fulva*, but, in spite of very careful dissection of many of the flowers of this most puzzling plant, I cannot see my way to adopting that as a species separable from *G. merquensis*, Wight.

3. *GARCINIA ROSTRATA*, Benth. and Hook fil. Gen. Plantar. I, 174. A tree 30 to 40 feet high. Young branches terete, pale, slender. *Leaves* thinly coriaceous, elliptic-oblong, with a rather short blunt acumen, the base much narrowed: both surfaces shining, the lower rather pale, midrib prominent: nerves very numerous, thin, sub-horizontal, rather distinct when dry, especially on the lower surface; length 2.5 to 3.5 in., breadth 1.25 to 1.75 in., petiole .2 in. *Male flowers* .15 in. in diam., in slender, pedunculate, lax, often dichotomous, 3- to 9-flowered cymes which are in fascicles of 2 to 4 in the axils of the leaves; buds depressed-globose, .1 in. in diam.; the pedicels .25 to .35 in., slender: *sepals* 4, orbicular, concave, the outer pair small, fleshy, the inner thin as large as the petals: *petals* 4, orbicular, concave, thin, each with a fleshy coloured circular patch near its base: *stamens* numerous; *anthers* sessile, on both

sides of 4 thick fleshy processes; cells 2, orbicular-oblong seated on the apex of the thick connective, dehiscing along the convexity: stigma very large, discoid, smooth, depressed in the centre, covering the stamens. *Hermaphrodite flowers* in 3-flowered, axillary, solitary, sessile, bracteolate cymes; sepals as in the male; *petals* 4, orbicular-reniform, not covering the stigma, otherwise as in the male; *anthers* in 4 masses as in the male, 4-celled; *stigma* sub-sessile, covering the whole ovary, large, discoid, smooth, entire. *Fruit* solitary, or 2 or 3 from an axil, ovoid, sub-orbicular, .5 to .65 in. long and rather less in diam, smooth, crowned by the discoid sub-concave stigma. Pierre Fl. Forest. Coch-Chine, fasc. VI, p. v, tab. 91, B. *Discostigma rostratum*, Hassk. Cat. Pl. Hat. Bogor. 213. Hook. fil. Journ. Linn. Soc. XIV, 486.

Malacca; Griffith, No. 855, Maingay 156 Perak: Scortechini 1962, King's Collector Nos. 8486, 10762. Distrib. Java.

This is readily distinguished by its small flowers on slender pedicels, and by its flattened buds: also by the sub-horizontal, close, rather distinct, venation of the leaves.

4. *GARCINIA CUSPIDATA*, King, n. sp. A tree 60 to 70 feet high; the young branches terete, dark-coloured. *Leaves* elliptic-ovate, shortly sub-spathulate, cuspidate, the base narrowed; upper surface shining, the lower dull; nerves sub-horizontal, distinct beneath when dry, .1 in. apart, anastomosing with an intramarginal nerve; length 2.5 to 3.25 in., breadth 1.1 to 1.5 in., petiole .3 in. *Male flowers* .15 in. in diam., in shortly pedunculate, axillary, 6 to 9-flowered, spreading cymes; buds pyriform; pedicels slender, .3 to .6 long; *sepals* 4, equal, reflexed, orbicular, thin, concave; *petals* 4, reflexed, covering the stamens and stigma in bud, thin, orbicular, concave, a little larger than the sepals: *stamens* numerous, on both sides of 4 fleshy processes, filaments very short and thick: *anthers* with 4 globular cells, each dehiscing by a long vertical suture; *style* short, cylindric; stigma capitate, small, quite concealed by the staminal masses. *Female flowers* and *fruit* unknown.

Perak, at low elevations: King's Collector, No. 10865.

Collected only once by the late Mr. Kunstler. The leaves a good deal resemble those of *G. rostrata*, Hassk.; but the nerves are slightly more distinct, and the flowers have a different androecium, although externally they much resemble those of *G. rostrata*, Hassk.

5. *GARCINIA WRAYI*, King, n. sp. A small spreading tree; young branches very slender, terete, dirty yellow. *Leaves* thinly coriaceous, ovate or elliptic, the apex produced into a long sub-spathulate point, the base cuncate; upper surface shining, the lower dull, pale; nerves slender, sub-horizontal, .05 in. apart, invisible on the upper and faint on the lower surface even when dry; length 2 to 2.5 in., of which

the apical tail is sometimes as much as .75 in., breadth .8 to 1.2 in.; petiole .2 in. *Male flowers* .15 in. in diam., in axillary fascicles of 2 or 3; buds globose, pedicels .15 in.; perianth reflexed, *sepals* 4, the outer less than half as large as the inner pair, all orbicular, sub-coriaceous and concave; *petals* 4, ovate-orbicular, blunt, with a thickened spot near the base, covering the stamens in bud; *stamens* numerous, on both surfaces of 4 fleshy processes; anthers sessile, globular-oblong, the connective rather thick, 2-celled, dehiscence vertical; rudy. style cylindric, convex, smooth. *Female flowers* axillary, solitary, pedicels as in the male; *sepals* 4, orbicular, thin, concave, about the same size as the petals and neither sepals nor petals quite covering the stigma in bud: *petals* 4, orbicular, concave, with a coloured thickened spot near the base; disk lobed, shallow, fleshy: staminodes none; *ovary* cylindric; *stigma* hemispheric, smooth, entire, enveloping the whole of the ovary, ultimately becoming discoid and slightly depressed in the middle.

Perak; on Ulu Batang Padang and on Gunong Batu Pateh, at elevations of 4,500 feet and upwards. Wray, Nos. 267, 362, 1527; Scortechini, No. 323b.

I have not seen ripe fruit of this, but (from the appearance of a young one) it is probably ovoid. In its leaves, this species rather resembles *G. merguensis* and *rostrata*.

6. *GARCINIA DIVERSIFOLIA*, King, n. sp. A tree 40 to 60 feet high; young branches rather thick, 4-angled, yellowish. *Leaves* lanceolate and sub-acute, to elliptic and shortly and bluntly cuspidate, the base always cuneate; upper surface shining, the lower dull, slightly pale when dry; midrib prominent on both surfaces; the nerves numerous, about .05 in. apart, spreading, straight, visible on the upper, invisible on the lower surface; length of the lanceolate form 3.5 to 4.5 in., breadth 1.5 to 1.75 in.; length of the elliptic form 2.5 to 4.25 in.; breadth 1.4 to 2.75 in., petiole .2 to .4 in. *Male flowers* .75 in. in diam., in 3 to 6-flowered, bracteolate, axillary cymes; buds globular-ovoid; pedicels unequal, from .2 to .4 in.; bracteoles orbicular, fleshy: *sepals* 4, orbicular, fleshy, concave, the outer pair small, united by their bases and sometimes irregularly denticulate, inner pair as large as the petals: *petals* 4, ovate-orbicular to orbicular, fleshy, concave; *stamens* very numerous, occupying both sides of 4 fleshy processes: anthers sessile, 2-celled, the connective thick, bifid, bearing at its upper part the two sub-orbicular suturally-dehiscent cells: rudy. pistil with cylindric style thickened upwards: the stigma large, hemispheric, entire, sub-papillose. *Female flowers* in cymes like the males but fewer-flowered and often terminal, perianth as in the male; staminodes apparently none; *ovary* depressed-globose, smooth: *stigma* sessile, discoid, entire, its surface

minutely lobulose. *Fruit* (unripe) sub-globular, '6 in. in diam., crowned by the stigma.

Perak; at elevations of 3000 to 3,500 feet, King's Collector, No. 6920, Wray, No. 1209.

7. *GARCINIA CADELLIANA*, King, n. sp. A tree about 30 feet high; the young branches, slender, terete, brownish yellow. *Leaves* thinly coriaceous, elliptic to elliptic-oblong, sub-acute, the base very cuneate; both surfaces shining; main nerves 10 to 12 pairs, inter-arching very near the margin, thin, slightly prominent on both surfaces when dry; length 3·5 to 5·5 in., breadth 1·5 to 2·5 in.; petiole '25 to '35 in., stout. *Male flowers* '25 in. in diam., in dense 3 to 8-flowered axillary fascicles, buds globose, pedicels '1 in., bracteolate at the base, stout; *sepals* 4, slightly unequal, small, orbicular, fleshy, the edges thin: *petals* 4, obovate-orbicular, fleshy, concave: *stamens* numerous, on both sides but especially on the inner sides of 4 fleshy processes opposite the petals; anthers oblong, sessile, 2-celled, the dehiscence longitudinal; style cylindric, as long as the staminal bundles; stigma large, hemispheric, papillose, entire. *Female flowers* and fruit unknown.

Andamans; King's Collector, No. 371.

8. *GARCINIA SPECTOSA*, Wall. Pl. As. Rar. iii. t. 258. A tree 40 to 60 feet high; the young branches slightly 4-angled, yellowish when dry. *Leaves* thinly coriaceous, oblong or elliptic-oblong, sometimes oblanceolate, shortly acuminate, the base cuneate; both surfaces shining, the midrib, main and intermediate nerves all rather prominent; length 5 to 8 in., breadth 2 to 3·75 in.; petiole '5 to '6 in. *Male flowers* 1·5 to 2 in. in diam., terminal in fascicles of 4 or 5, or solitary; peduncles longer than the petioles. *Sepals* 4, fleshy, concave, slightly unequal, 1 pair ovate and 1 pair reniform. *Petals* 4, yellow, larger than the sepals, rotund, slightly clawed. *Stamens* numerous, in 4 short, thick, diverging, oval masses confluent at the base; filaments short; anthers oblong with longitudinal dehiscence. *Style* short, thick, columnar; rud. stigma large, convex, with 6 shallow, broad, blunt lobes. *Female flowers* solitary, terminal, on short thick pedicels; perianth larger than in the male; ovary sub-globular, the stigma large, convex, the margin 6 to 8-lobed. *Flower* unknown. Unripe *fruit* ovoid, sub-globose, apiculate, the hardened stigma and the thickened sepals persistent. Wall. Cat. 4855, 4852 E. *Garcinia affinis*, Wall. Cat. 4854. Choisy Guttif., Ind. 23; Planch. and Triana Mem. Guttif., 171; Kurz For. Fl. Burma. I, 88; Pierre Fl. Forest. Coch-Chine, fasc. IV, p. xiv, tab. 79, excl. figs. H. and I.

Andaman Islands; Kurz. Distrib. Tenasserim.

This arboreous species is no doubt very closely allied to the shrubby

G. Kurzii, Pierre. And it appears probable that, although its headquarters are Burmah and Sylhet, *G. speciosa* does occur on the Andamans. M. Pierre relies, as a diagnostic mark of his *G. Kurzii*, on its having solitary male flowers, whereas those of *G. speciosa* are fasciculate. But in Calcutta Herbarium specimens of the same set which M. Pierre would refer to his *G. Kurzii*, the flowers are sometimes solitary and sometimes clustered. Another mark which M. Pierre relies on is that the peduncles of the flowers of *G. speciosa* are described by Wallich as two or three times as long as the leaf petioles, whereas in *G. Kurzii*, the peduncles are shorter than the petioles. The female flower of *G. speciosa* is described in the Flora of British India as unknown, and M. Pierre says the same of the female flower of his *G. Kurzii*. Wallich's specimens of *G. affinis* from Sylhet have advanced female flowers, and it is from these that I have described the female flower (figured by Pierre, tab. 79, fig. G.): for *affinis* appears to me in no way distinct from *speciosa*. Wallich was no doubt misled by the size of the rudimentary stigma in the male flowers of *speciosa* into considering these as hermaphrodite, and it is probable that he never saw true female flowers. This view is supported by the fact that he does not describe either ovary or fruit. Pierre (l. c. t. 79, figs. H. and I.) gives drawings of what he believes to be the male and female flowers of *G. speciosa*. But in his text (fasc. VI, p. xiv), he states that the flowers thus figured were, in the specimen from which he took them, unattached to any leaf-twigg and were mixed with flowers of other species. They are therefore altogether doubtful even for M. Pierre.

9. *GARCINIA KURZII*, Pierre, Flor. Forest. Coch.-Chine, fasc. VI, p. xiv, t. 78 B. A shrub with the branchlets and leaves of *G. speciosa*, but the leaves less acuminate and with longer petioles. Flowers as in *speciosa*, but the stamens less numerous and the rudimentary stigma discoid and flat. Ripe fruit unknown.

Andaman Islands; Kurz, King's Collector.

This differs from *G. speciosa* chiefly in being a shrub, and in its rudimentary stigma being flat and discoid, instead of convex. Both this and *speciosa* differ but little from *G. cornea*, Roxb., a species indigenous to Amboina.

10. *GARCINIA HOMBRONIANA*, Pierre, Fl. Forest. Coch.-Chine, fasc. VI, p. xii, t. 79, figs. D. E. F. J. A tree, with rather stout, 4-angled branches, yellowish when dry. Leaves elliptic to oblong-elliptic, slightly inequilateral, sub-acute or very shortly and abruptly blunt-acuminate; the base cuneate, slightly unequal: upper surface slightly glossy, the under rather dull; nerves numerous, ascending, not prominent on either surface; the midrib bold on both; length 3.5 to 5 in., breadth 2 to 2.75

in., petiole .5 in. *Male flowers* about 1 in. in diam., terminal, in fascicles of 3 to 6, pedicels .2 to .4 in. *Sepals* thinly coriaceous, concave, the outer pair orbicular; the inner ovate-oblong, blunt. *Petals* ovate-orbicular, twice as long as the sepals. *Stamens* numerous; the filaments united in a fleshy, slightly 4-lobed, annulus on which the broad, oblong, vertically dehiscing anthers are inserted; rudimentary stigma slightly protruding above the mass of stamens, flat, 8-lobed. *Female flower* terminal, solitary, with sepals and petals like the male; staminodes absent. *Ovary* globose; the stigma large, convex, recurved at the edge when young, when adult with 8 shallow crenations. *Fruit* sub-globular, not mammillate, about 1 in. in diam.; the pericarp rather thin, sub-crustaceous; sepals persistent. *Seeds* about 6, oblong, with soft juicy arillus.

Malacca; Griffith, No. 857 (Kew Dist.). Perak; Scortechini (1 specimen). Nicobar Islands; Kurz, Jelinek.

This species, which has been established by M. Pierre, comes (as his own description and figures show) very near to *G. cornea*, Linn. It differs chiefly from *cornea* by its broader leaves, stouter branchlets and 8-lobed stigma. Curtis's Penang specimen No. 690, probably belongs to this species.

11. *GARCINIA MANGOSTANA*, Linn. A glabrous tree 20 to 30 feet high; young branches cylindric, slightly grooved, the bark smooth, green. *Leaves* thickly coriaceous; shining on both surfaces, elliptic-oblong, acute or shortly acuminate, the base cuneate; nerves sub-horizontal, numerous, interarching with a double intra-marginal nerve, rather prominent beneath when dry; length 6 to 10 in., breadth 2.5 to 4.25 in., petiole .75 to 1 in. *Male flowers* 1.5 in. in diam., in terminal fascicles of 3 to 9; pedicels .5 to .75 in., with several orbicular, concave, scarious bracts. *Sepals* 4, unequal, coriaceous, rotund, concave. *Petals* 4, larger than the sepals, ovate, fleshy, yellowish tinged with greenish red. *Stamens* indefinite, in a 4-lobed mass; filaments short: anthers oblong, ovate, recurved, dehiscence longitudinal. *Pistil* 0. *Disk* fleshy, as long as the stamens, its apex conical. *Hermaphrodite flowers* 2 in. in diam., solitary or in pairs at the apices of the young branches, and usually on different trees from the male flowers; pedicel .5 in. long, stout, woody. *Calyx* and *corolla* as in the male, but larger. *Stamens* many; filaments slender, connate below; anthers irregular and mostly abortive. *Ovary* globular, 4 to 8-celled; stigma sessile, 8-rayed; ovules solitary. *Fruit* as large as a small orange, smooth, dark purplish brown; pericarp thick; seeds oblong, flattened, with large white juicy arillus. Bl. Bijdr. 213; DC. Prod. i, 560; Roxb. Fl. Ind. ii, 618; Bot. Mag. t. 4847; Choisy Guttif. Ind. 33; Planch. and Triana Mem. Guttif. 170; Miq. Fl. Ind. Bat. I, pt. ii, p. 506; Hook. fil. Fl. Br. Ind. i, 260; Kurz For. Fl.

Burm. I, 87; Lanessan Mem. Garcin. 15: Pierre Flor. Forest. Cochinchine t. 54.

Wild and cultivated in the Malayan Peninsula and Archipelago: cultivated also in Burma, Ceylon and a few places in the S. of India.

12. *GARCINIA MICROSTIGMA*, Kurz, Journ. Bot. 1875, p. 324; For. Flora Burmah, I, 91. A shrub 4 to 6 feet high: young branches obscurely 4-angled, the bark dark-coloured. *Leaves* elliptic to elliptic-oblong or lanceolate, sub-acute, the base cuneate; rather dull on both surfaces when dry, the midrib distinct beneath; main nerves 7 to 8 pairs, thin, interarching .1 to .2 in. from the margin; length 3 to 4 in., breadth 1.5 to 2.3 in., petiole .5 to .75 in. *Male flowers* .3 in. in diam., in 2 to 3-flowered, few bracteoid, axillary cymes; buds globose; pedicels .2 to .25 in. long; *sepals* 4, the outer pair ovate-acute, fleshy, keeled, the edges thin, longer than the inner obovate-orbicular, very concave, thinner pair: *petals* 4, obovate-orbicular, fleshy, concave, about the same size as the inner sepals and barely covering the stamens; *stamens* about 20, on a single convex receptacle, filaments short; anthers red, broadly ovate, 2-celled, the dehiscence longitudinal: rud. stigma 0. *Female flowers* (fide Kurz) on shorter pedicels than the male and probably solitary, terminal. *Fruit* globose, 1.5 to 2 in. in diam., the pericarp smooth, thin, red, the sepals persistent at its base, and its apex bearing the very minute discoid sessile entire stigma; *seeds* 2 or more. Pierre Fl. Forest. Coch-Chine, fasc. VI, p. xix.

South Andaman; Kurz.

13. *GARCINIA PENANGIANA*, Pierre, Fl. Forest. Cochiu-Chine, fasc. vi, p. xxxvii, No. 46a. A slender tree 20 to 30 feet high; the young branches glossy, pale brown when dry, slightly 4-angled. *Leaves* oblong-lanceolate, shortly and rather bluntly acuminate, the base cuneate; upper surface shining, the lower slightly dull and paler, both, (but especially the lower) with a reddish tint when dry; the midrib stout: nerves close, straight, sub-horizontal, faintly visible; length 4.5 to 7 in., breadth 1.5 to 2.5, or even 3 in.; petiole .5 in. or less. *Male flowers* 1 in. in diam., in terminal fascicles of 3 to 6, pedicels about .5 in. *Sepals* 4; the outer pair rotund, fleshy; very concave; the inner pair larger, thinner, elliptic, obtuse. *Petals* 4, rather longer than the inner sepals, oblong, blunt, creamy-white. *Stamens* indefinite, the filaments united in a slightly 4-lobed short fleshy mass: anthers short, broad, with longitudinal dehiscence; pistil 0. *Female flowers* terminal, solitary, larger than the male and on shorter stouter peduncles. *Style* short, thick: *ovary* globular; the stigma large, convex, hemispherical, corrugated, and deeply 4-lobed; *stamens* none. *Ripe fruit* globular, more than 1.75 in. in diam., crowned by the persistent stigma, the thickened

sepals persistent at its base; pericarp thin, crustaceous. *Seeds* few, ovate. *G. cornea*, Wall. Cat. 4852 D.; Hook. fil. Fl. Br. Ind. I, 260 (in part). *G. fascicularis*, Wall. Cat. 4853, Pierre l. c., p. xvi.

Penang; Porter (Wallich's Collector), Curtis. Perak; King's Collector, Scortechini.

This plant, first distinguished as a species by M. Pierre, seems to be rather common in Penang and Perak. Ripe fruits are as yet unknown: those in Mr. Kunstler's specimens No. 3583 (noted by him as unripe) measure 1.25 in. in diam. A fruit on one of Scortechini's specimens measures half an inch more. Mr. Kunstler notes the tree as occurring at elevations of 300 up to 3,000 feet. The foregoing description of the flower does not quite agree with that of M. Pierre, which was drawn up from specimens without female flowers and with buds only of the male flowers.

14. *GARCINIA MALACCENSIS*, Hook. fil. Fl. Br. Ind. I, 261. A tree; the branchlets rather stout, 4-angled. *Leaves* brown when dry, elliptic, shortly and abruptly acuminate, the base much narrowed, shining above, the lower surface rather dull; midrib bold, prominent on both surfaces; nerves numerous, faint, sub-horizontal, connected by oblique secondary nerves; length 4 to 8 in., breadth 1.5 to 2.5 in.; petiole .4 to .6 in., channelled. *Male flowers* 1 in. in diam., in terminal fascicles of 4 to 6; pedicels .25 to .65 in. long. *Sepals* orbicular, concave, fleshy. *Petals* twice as long as the sepals, dull red, broadly ovate, shortly clawed. *Stamens* very numerous, densely imbricated in a sub-cylindric or conical truncate mass formed of the fleshy conjoined filaments; *anthers* adnate, broadly ovoid, 2-celled, the connective broad: stigma large, convex. *Ovary* abortive. *Female flowers* 1.5 to 2 in. in diam. terminal, solitary, red. *Staminodes* few or 0. *Ovary* globose, 8-celled; stigma sessile, large, convex, enveloping half the ovary, much corrugated and deeply 8-lobed. *Fruit* unknown. Pierre Flore Forest. Coch.-Chine, fasc. VI, p. xi, t. 78, fig. D.

Malacca; Maingay (Kew Distrib. No. 149). Of this I have seen only Maingay's specimens. In its leaves, in the colour of its flowers, and in its 8-lobed stigma, this resembles *G. mangostana*.

15. *GARCINIA MAINGAYI*, Hook. fil. Fl. Br. Ind. I, 267. A tree 40 to 60 feet high; young branches thick, 4-angled, and dark-coloured when dry. *Leaves* oblong-elliptic, obtuse with short blunt apiculus, the base narrowed; both surfaces shining, the lower pale brown when dry; nerves 9 to 13 pairs, bold, spreading, prominent beneath as is the midrib; length 4.5 to 7 in., breadth 2.25 to 3.25 in., petiole .75 in. *Male flowers* 1 to 1.25 in. in diam., waxy white, in terminal or axillary, 3 to 6-flowered, shortly peduncled umbels; pedicels .25 to .5 in. long. *Sepals*

4, orbicular, fleshy, concave, the outer pair rather smaller than the inner. *Petals* 4, larger than the sepals, ovate-orbicular, fleshy, concave. *Stamens* very numerous, forming with the rudimentary pistil a dense globular mass; the filaments slender, in several rows from a stipitate fleshy receptacle; anthers oblong, curved, 2-celled, with extrorse longitudinal dehiscence; rud. pistil cylindric, with a broad discoid stigma. *Female flowers* solitary, terminal, sub-sessile; *sepals* and *petals* as in the male but smaller; *staminodes* few, slender; *ovary* globose 4 to 6-celled; the stigma large, convex, papillose, entire or very slightly 4-lobed. *Fruit* globular, 2 to 2.5 in. in diam. when quite ripe; crowned by the large, flat, discoid, papillose, slightly 4-lobed stigma. *Pierre Flore Coch.-Chine*, fasc. VI, p. xvii.

Perak; common. Malacca; Maingay (Kew Dist. 160 and 161). Pangkore; Curtis No. 1610.

In Scortechini's field-note on this species, the young branches are described as terete; but, in the dried state, they are distinctly 4-angled.

Var. *stylosa*; stigma on a thick style .3 in. long.

Perak. King's Collector, No. 5359.

Only specimens with immature fruit are known, but these differ from the typical form in no respect except the stout style.

16. *GARCINIA ATROVIRIDIS*, Griff. MSS. A graceful tree 40 to 60 feet high; the young branches rather thick, sub-terete, yellowish-grey when dry. *Leaves* coriaceous, both surfaces shining; narrowly oblong, very shortly but sharply acuminate, the base cuneate; nerves numerous, spreading, straight, indistinct when fresh, but rather distinct when dry, anastomosing .05 to .1 in. from the edge with a fine intra-marginal nerve: length 4.5 to 8 in., breadth 1.25 to 2 in., petiole, .6 to .75 in. *Male flowers* 1.25 in. in diam., in terminal clusters of few-flowered cymes, pedicels unequal, from .25 in. to .75 in., long. *Sepals* 4, fleshy, concave; the outer pair orbicular or transversely oblong; the inner pair broadly oblong or orbicular, fleshy with thin edges, larger than the outer pair, streaked with red inside. *Petals* 4, orbicular-ovate, concave, fleshy, larger than the sepals, red. *Stamens* very numerous, forming with the large convex rudimentary stigma a globose mass; filaments slender, nearly as long as the anthers, inserted in whorls on a thin annular fleshy receptacle: *anthers* narrowly oblong, 2-celled, extrorse, the dehiscence longitudinal. Rud. style cylindric. *Female flowers* terminal, solitary, rarely geminate; *sepals* and *petals* as in the male, but the petals smaller; *staminodes* small, attached to a thin fleshy wavy annulus which surrounds the ribbed, sub-cylindric, 12- to 16-celled ovary. *Stigma* thick, fleshy, very convex, pilate, deep red, the edges undulate. *Fruit* (*vide*

Scortechini) globular, 3 in. in diam. yellowish-green, crowned by the sessile, concave, ribbed stigma. Hook. fil. Fl. Br. Ind. I, 266 : Pierre Fl. Coch.-Chine, fasc. VI, p. xxiv, tab. 80, fig. C.

Malaeca; Maingay (Kew Dist. No. 154.) Perak; Seorteehini, Wray. Wellesley Province, King's Collector. Penang, Curtis, No. 855.

According to Mr. Curtis, the fruit is eaten by the Malays in curries, and the tree is a very handsome one with pendulous branches. I have not seen fully ripe fruit, and the above description of it is taken from Fr. Seorteehini's field notes.

17. *GARCINIA OPACA*, King. A tree 40 to 60 feet high; the branchlets when dry, dull dirty yellow, striate. *Leaves* oblong, narrowed at each end, the apex sometimes shortly acuminate, the base cuneate; upper surface slightly shining, lower surface opaque, whitish; the rather numerous nearly horizontal nerves thin, little visible on either surface, the midrib bold and prominent on both; length 4 to 5 in., breadth 1·75 to 2·25 in., petiole ·6 in. *Male flowers* ·75 in. in diam., in shortly pedicelled, 2 to 3-flowered, ebracteolate, terminal or axillary cymes; pedicels ·25 in., annulated; *sepals* 4, obovate, concave, thin, veined; *petals* 4, similar to the sepals but a little larger: *stamens* numerous, on a single, convex, fleshy receptacle; *anthers* sessile, depressed-globular, with circumscissile dehiscence: rud. *stigma* 0. *Female flowers* solitary, terminal: *sepals* more coriaceous than those of the male flower; staminodes 0; *ovary* cylindric; stigma convex, smooth, the edge irregularly subcrenate. *Fruit* solitary, terminal, ovate-globose, slightly mammillate, crowned by the broad flat stigma which has 4 broad shallow rounded lobes; the sepals rounded, cartilaginous, persistent; pericarp brown when dry, thin, crustaceous. Seeds several, ovoid, flattened on one side. *G. cornea*, Wall. Cat. 4852 E.

Perak; King's Collector, Scortechini.

Distinguished by its leaves opaque and whitish beneath and with faint sub-horizontal nerves. In fruit this resembles *G. Penangiana*; but it has a very different stigma.

18. *GARCINIA CALYCINA*, Kurz, Journ. Bot. 1875, p. 324. A shrub 15 feet high; young branches slender, slightly angled, pale brown when dry. *Leaves* thinly coriaceous, elliptic-oblong to elliptic, abruptly and shortly caudate-acuminate or sub-acute, the base cuneate; upper surface shining, the lower rather dull and pale; main nerves 7 or 8 pairs forming bold intra-marginal arches, the intermediate nerves very numerous, all slightly prominent beneath; length 3 to 5 in., breadth 1·25 to 2 in., petiole ·3 to ·5 in. *Male flowers* ·15 in. in diam., axillary, solitary or in 2- to 3-flowered fascicles; buds globular, pedicels ·15 in. long. *Sepals* and *petals* each 4, equal, orbicular, concave, the petals veined; *stamens*

under 20, in a single convex group, the filaments very short, the connective rather thick, the elongate 2-celled anthers bent like a horse shoe over the apex of the connective and dehiscing along the convexity; rudimentary stigma 0. *Female flowers* larger than the male, subsessile, solitary, axillary; *sepals* broadly ovate, the outer pair larger than the inner; staminodes about 12, distinct, short, square; ovary hidden by the large hemispheric, lacunose, deeply 4-lobed stigma. *Fruit* (immature) ovoid-oblong, smooth, the sepals persistent at its base and the apex crowned by the sessile stigma. Pierre Flore Forest. Coch.-Chine, fasc. VI, p. xxxiii, tab. 87 D.

Nicobar Islands; Kurz.

19. *GARCINIA COSTATA*, Hemsley MSS. in Herb. Kew. A tree 50 to 70 feet high; young branches pale, flattened. *Leaves* thinly coriaceous, elliptic, acute, the base cuneate; both surfaces rather dull, the lower paler; nerves bold, spreading, 13 to 18 pairs, very distinct on the lower surface when dry; length 6 to 14 in., breadth 3.5 to 6 in.; petiole 1 to 1.5 in., stout. *Male flowers* 1 to 1.25 in. in diam., in shortly peduncled, 3- to 5-flowered, terminal cymes; pedicels .25 to .5 in. *Sepals* 4, equal, orbicular, fleshy, concave. *Petals* larger than the sepals, pale yellow with a reddish tinge, orbicular-ovate, fleshy, concave. *Stamens* numerous, forming with the discoid stigma an oblong 4-angled mass; filaments short, thick, inserted on a fleshy receptacle; anthers thick, cuneate with flattish tops, 2-celled; the cells large, curved, with extrorse longitudinal dehiscence; rudimentary stigma large, discoid. *Female flowers* solitary, terminal, on short thick pedicels: *sepals* and *petals* as in the male: staminodes about 12: *ovary* with many vertical grooves; *stigma* large, discoid, with radiating grooves corresponding to those of the ovary, the edge wavy. *Fruit* depressed-spheroidal, 3 in. in diam. by 2 in. high, with many deep vertical grooves, pale rose-coloured to crimson.

Perak; on Gunong Bubo at elevations of 2500 to 3000 feet, King's Collector; Maxwell's hill, Wray.

A remarkably fine species, at once known by its large deeply grooved eatable fruit.

20. *GARCINIA GRIFFITHII*, T. Anders. in Hook. Fl. Ind. I, 266. A tree 60 to 100 feet high, the young branches sub-tetragonous, yellowish-green. *Leaves* large, coriaceous, bullate, oval to ovate-elliptic, sub-acute or rather blunt; the base slightly narrowed, sometimes slightly cordate; both surfaces shining, the lower paler; midrib stout; nerves 16 to 24 pairs, bold, sub-horizontal; length 9 to 16 in., breadth 4 to 8 in., petiole .6 in. *Male flowers* .75 in. in diam., in dense 3 to 10-flowered cymes from tubercles in the axils of leaves or of fallen leaves; pedicels .25 in. *Sepals* 4, equal, orbicular, fleshy, concave. *Petals* 4, oblong, blunt

fleshy, red. *Stamens* from 25 to 40, in a square flat-topped mass : anthers nearly sessile, broadly oblong, the connective wide ; the cells 2, lateral, slightly curved, their dehiscence longitudinal ; rud. ovary 0. *Female flowers* in few-flowered axillary cymes ; pedicels thick, .2 in. long. *Sepals* and *petals* as in the male ; staminodes in 4 bundles of unequal length : ovary ribbed, 12-celled ; style very short ; stigma with many conical papillae, peltate, slightly depressed in the middle, its margins crenate, *Fruit* sub-globular, 2 to 3 in. in diam. when ripe, greenish yellow, crowned by the concave papillate stigma, very glutinous. Pierre Flore Coch.-Chine, fasc. VI, p. xxvi, tab. 80, fig. B.

Malaeca ; Griffith 861, Maingay 153 (Kew Distrib). Perak, common. Pangkore, Curtis 1609. Distrib. Sumatra ; Forbes, No. 2994.

21. *GARCINIA FORBESII*, King, n. sp. A small tree, young branches subtetragonous, yellowish. *Leaves* thinly coriaceous, oblanceolate to ovate-lanceolate, shortly acuminate, the base cuneate ; both surfaces slightly dull when dry, the lower slightly pale ; nerves spreading, anastomosing with an intra-marginal nerve, .15 in. apart, the intermediate rather bold, all distinct below when dry ; length 3.5 to 5 in. breadth 1.5 to 2.5 in., petiole .3 to .4 in. *Male flowers* .25 in. diam. in 3 or 4-flowered clusters from small axillary tubercles, buds sub-globose, pedicels .1 to .15 in. *Sepals* 4, equal, rather thin, pale-coloured, orbicular, concave. *Petals* 4, fleshy, orbicular, dark-coloured, concave. *Stamens* numerous, in a single convex mass, the connective small ; anthers sessile, sub-orbicular, 2-celled with longitudinal dehiscence ; rud. ovary 0. *Female flowers* axillary, solitary, sessile : *sepals* 4, broadly ovate, blunt, fleshy, concave ; *petals* 4, orbicular, fleshy, concave, red to orange ; *stigma* sessile, convex, completely covering the ovary, entire, its surface with prominent glandular papillae. *Fruit* (young) ovoid, crowned by the stigma.

Perak ; Wray 3396. Sumatra ; Forbes Nos. 2936 and 3152.

22. *GARCINIA BANCANA*, Miq. Fl. Ind. Bat. Suppl., 494. A tree 60 to 80 feet high ; young branches stout, nodular, not angled, black and shining when dry. *Leaves* coriaceous, large, broadly obovate-lanceolate ; the apex rounded, often slightly and bluntly mucronate : much narrowed in the lower third into the stout winged petiole ; upper surface shining, the numerous and very oblique nerves distinct ; lower surface dull, opaque, pale brown, the nerves obsolete ; midrib prominent in both ; length 5 to 7 in., breadth 2 to 3 in., petiole .75 to 1.25 in. *Male flowers* .15 in. in diam., in crowded fascicles of 6 to 12, from short densely bracteolate tubercles in the axils of leaves or of fallen leaves ; pedicels unequal, .25 to .5 in. long ; bracteoles ovate, coloured, .1 in. or less. *Sepals* 4, orbicular, concave, fleshy, the outer pair larger than the inner. *Petals* 4, ovate, blunt, fleshy, concave. *Stamens* numerous, in a

convex sub-cylindric mass: the anthers sub-sessile, broad, with 2 small oval cells at the extremities of the transversely lengthened connective; rudimentary pistil 0. *Female flower* solitary?, sub-sessile; stamiuodes 6 to 10, solitary or in two or three groups. *Ovary* sessile, globular, slightly grooved vertically: stigma hemispheric, with 8 triangular rays. *Fruit* ovoid, 1·25 in. long, and 1·1 in. diam.; about 8-seeded. Miq. Ann. Mus. Lugd. Bat. I, 208; Hook. Fl. Br. Ind. I, 263; Scheff. Obs. Phyt. pt. ii, 41; Pierre Flore Forest. Cochin-Chine fasc. VI, pp. xxvi and xxxviii. *Garcinia Lamponga*, Miq. Fl. Ind. Bat. Suppl. 494; Ann. Mus. Lugd. Bat. I, 208; Pierre l. c. *G. Hookeri*, Pierre l. c. p. xxvii. *G. leucandra*, Pierre, l. c. xxvii.

Perak; King's Collector, Scortechini. Malacca; Maingay (No. 158, Kew Dist.). Distrib. Banka, Sumatra.

I have examined the type specimens of Miquel's *G. bancana* and *Lamponga*, and I believe them to belong to one and the same species. One of his Sumatran specimens of *G. Lamponga* bears, however, besides leaves of the shape described above, some that are broadly elliptic. Pierre reduces to this two more of Miquel's Sumatran species, namely, *G. oxyedra* and *G.?* *oxyphylla* (Fl. Ind. Bat. Suppl. 494, 495); but of these I have not seen Miquel's types.

23. *GARCINIA COWA*, Roxb. Fl. Ind. II, 622. A dioecious tree 30 to 60 feet high: young branches slender, not angled, dark-coloured when dry. *Leaves* broadly lanceolate, acute at both ends, the apex sometimes acuminate, both surfaces rather dull when dry: the nerves thin but rather distinct when dry, numerous, rather straight, oblique; length 3·5 to 5 in. breadth 1 to 1·75 in. petiole ·3 to ·5 in. *Male flowers* ·4 in. in diam., axillary or terminal, in fascicles of 3 to 8; pedicels ·25 in. *Sepals* broadly ovate, fleshy, yellow. *Petals* twice as long as the sepals, obovate or oblong, blunt, yellow. *Stamens* numerous, on a convex fleshy receptacle, anthers 4-celled, stigma rudimentary. *Female flowers* ·8 in. in diam., terminal, in fascicles of 2 or 3, pedicellate like the males; *ovary* sub-globose, 6 to 8-celled; *stigma* sessile, flat, deeply divided into 6 or 8, papillose, wedge-shaped rays; *staminodes* in 4 clusters of 3 to 8, unequal. *Fruit* globular-depressed, not mammillate, with 4 to 8 vertical grooves, smooth, yellow, ·8 to 1·5 in. in diam.; pericarp thin; *seeds* ·5 to ·75 in. long, oblong, with a soft arillus. DC. Prodr. i, 561; W. and A. Prodr. i, 101; Choix. Guttif. Ind. 34; Planch. and Triana Mem. Guttif. 186; Wall. Cat. 4863; Lancessan Mem. Garcin. 54; *G. Roxburghii*, Wight Ic. 104. Kurz For. Fl. Burm. I, 90. *Oxycarpus Gangetica*, Ham. in Mem. Wern. Soc. V, 344.

Andaman Islands? Distrib. Assam and base of the Khasia Hills, Chittagong, Burmah; in tropical forests.

This is very near *G. Kydiana* but differs in the points noted under that species.

24. *GARCINIA KYDIANA*, Roxb. Fl. Ind. II, 623. A dioecious tree, 25 to 40 feet high; the branchlets dark-coloured when dry, not angled. *Leaves* thinly coriaceous, lanceolate, acuminate, the base acute, both surfaces shining; nerves thin but distinct when dry, rather few for this genus; length 3 to 5 in., breadth .75 to 1.5 in., petiole .35 to .5 in. *Male flowers* .75 in. in diam., in small axillary or terminal pedunculate umbels of 3 to 5, or solitary; pedicels .25 in. long; peduncles of the umbels .4 to .6 in. *Sepals* 4, equal, ovate, obtuse, fleshy, yellow. *Petals* twice as large as the sepals, broadly ovate, blunt, pale yellow. *Anthers* numerous, inserted into the slightly 4-lobed fleshy mass of conjoined filaments, square, 4-celled (a cell at each angle) pistil 0. *Female flowers* axillary and terminal, solitary, sessile. *Sepals* and *petals* as in the male; staminal nodes 4, small, 3 or 4-fid. *Ovary* globular, sessile, 6 to 8-lobed; stigma sub-sessile, with 6 to 8 spreading glandular rays. *Fruit* 1 to 1.5 in. in diam., smooth, yellow, globular, depressed, with 6 to 8 deep vertical grooves near the apex, and with a nipple-like protuberance from the depressed apex on which is inserted the persistent stigma. *Seeds* 6 to 8, oblong, .85 in. long; the arillus soft, acid, juicy. Kurz For. Fl. Burm. I, 90, *in part*; Pierre Fl. Forest. Coch.-Chine, fasc. VI. p. xxix. Lanesan Mem. Garein. 59, *in part*; *G. Roxburghii*, Wight Ic. II3; *G. Cowa* Roxb. Hook. fil. Fl. B. Ind. I, *in part*.

Andaman Islands.

Of the true Roxburghian *G. Kydiana*, the only specimens that I have seen are from the Andamans. The Burmese specimens referred to this species by Pierre and others belong mostly to *G. Cowa* as Roxburgh described and figured it. But the two species are very closely allied. The chief points that separate *Kydiana* from *Cowa* are its larger flowers, the arrangement of the males in distinct pedunculate umbels, the females always solitary and sessile; and, in the fruit, the curious nipple rising from the depressed apex, and the restriction of the vertical grooves to the neighbourhood of the apex. In the Flora of Br. India the two are united under *G. Cowa*. Griffith's Nos. 865 and 867, referred to *Kydiana* by Pierre, belong in my opinion to *G. nigro-lineata*, Planch.

25. *GARCINIA NIGRO-LINEATA*, Planch. MSS. A tree 20 to 50 feet high; young branches not angled, their bark rather dark. *Leaves* thinly coriaceous, lanceolate and acuminate, or ovate-lanceolate and shortly caudate-acuminate, the base acute; both surfaces shining, the lower ferruginous in some stages; midrib rather stout; main nerves rather distinct when dry, about .1 to .15 in. apart, the intermediate nerves almost as prominent; length 3 to 4.5 in., breadth 1 to 1.5 in., petiole

·2 to ·4 in. *Male flowers* ·25 in. in diam., in umbels of 3 to 8, on the apices of the branches, or from the axils of leaves or of fallen leaves; pedicels ·25 to ·5 in., slender. *Sepals* orbicular, fleshy, concave. *Petals* longer than the sepals, oblong, obtuse, concave. *Stamens* about 20, forming a tetragonal mass inserted on a convex receptacle, the filaments very short; anthers broad, cuneate with flat tops, 4-celled with vertical dehiscence, the connective thick; pistil 0. *Female flowers* apetalous, solitary, or in clusters of 2 to 5, axillary; *ovary* ovoid, 5 or 7-celled; stigma large, convex with a central smooth depression, bearing many black papillæ, and obscurely 5- to 7-lobed; staminodes about 8 to 10, not branched, their heads flat. *Fruit* ovoid-globose, ·5 to ·75 in. in diam., orange-coloured, pulpy, with a thick fleshy apiculous crowned by the persistent stigma. Hook. fil. Fl. Br. Ind. I, 263. Pierre Flore Forest. Coch.-Chine, fasc. VI, p. xxix, (excl. t. 81, fig. F.) *G. parvifolia*, Miq. Ann. Mus. Lugd. Bat. I, 208. *Rhinostigma parvifolium*, Miq. Fl. Ind. Bat. Supp. 495.

In all the provinces; in tropical forests. Distrib. Sumatra.

This is one of the commonest species of the genus. The pulpy fruit is eaten by the aborigines. Griff. No. 854 and Maingay Nos. 152 and 162 are the specimens on which Planchon founded the species. Griff. Nos. 865 and 867 (referred by Planchon and Triana and also by Pierre to *G. Kydiana*, Roxb.) in my opinion fall here, as also does *G. umbellifera*, Wall Cat. 4864, but Anderson reduces the latter to *G. Cowa*, Linn. Pierre's figure, (t. 81, fig. F.), which he names *S. nigro-lineata*, does not represent the flowers of the type specimens in the Calcutta Herbarium which bear the numbers which Pierre quotes. I fear therefore that there must have been some confusion in the distribution of the Griffithian collections.

It is quite possible that the description which I have given above may cover two species. The specimens with lanceolate-acuminate leaves have rather more erect and fainter nerves than these with ovate-lanceolate caudate-acuminate leaves. But, although I have dissected a large number of the male flowers of each, I cannot detect any tangible difference. Unfortunately I have been able to find very few female flowers. An examination of Miquel's type specimen of his *Rhinostigma parvifolium* leaves no doubt whatever that it is identical with Planchon's *G. nigro-lineata*.

I never find the petals reflexed: but Anderson, in Hook. fil. Fl. Br. Ind. (l. c.), describes them, and Pierre (l. c.), figures them, as reflexed from about the middle.

26. *GARCINIA KUNSTLERI*, King, n. sp. A shrub, 6 to 8 (rarely 15) feet high; the young branches dark-coloured, not-angled. *Leaves* mem-

branous, oblanceolate to narrowly ovate-lanceolate, shortly but sharply acuminate, the base much narrowed; smooth on both surfaces, the lower rather pale; nerves indistinct, spreading, 9 to 13 pairs, some of the intermediate almost as distinct as the primary; length 3·5 to 5 in., breadth 1·15 to 1·8 in., petiole ·35 to ·6 in. *Male flowers* about ·15 in. in diam., in small axillary or terminal fascicles of 3 to 6. *Sepals* 4, orbicular, fleshy, concave, their edges thin. *Petals* 4, broadly ovate, blunt, fleshy, concave. *Stamens* about 15, forming a convex mass; the anthers transversely flattened, 4-celled, the connective broad; rudimentary pistil 0. *Female flowers* solitary; *sepals* 4, orbicular, membranous, veined. *Petals* 0. *Staminodes* 4, with filaments half as long as the ovary, and flat square heads. *Ovary* thick, cylindric, vertically grooved; the stigma convex, with large prominent black-tipped conical papillæ, and with about 10 inconspicuous lobes. *Fruit* orange-yellow, depressed, sub-globose, nearly 1·5 in. in diam., smooth, the sepals persistent at its base for some time.

Perak; at low elevations, common: King's Collector, Scortechini, Wray.

This is allied to the Burmese *G. linoceroïdes*, T. Anders.; but has smaller flowers, fewer stamens and more acuminate leaves.

27. *GARCINIA SCORTECHINII*, King, n. sp. A tree 20 to 40 feet high; branchlets yellowish, slightly angled. *Leaves* thinly coriaceous, ovate-elliptic, occasionally ovate-lanceolate, shortly and rather bluntly acuminate, the base acute: both surfaces shining, the lower rather paler; main nerves 5 or 6 pairs, spreading, anastomising ·2 in. from the margin, very distinct on the under surface when dry, reticulations indistinct; length 2·75 to 4·75 in., breadth 1·5 to 2·5 in., petiole ·25 in. *Male flowers* ·2 in. in diam., sessile or shortly pedicellate, in clusters of 3 to 6 from small axillary tubercles; *sepals* 4, orbicular, concave, thin, veined; *petals* 4, broadly ovate, fleshy, concave; *stamens* varying from 10 to 20, inserted on a 4-angled receptacle; *anthers* with circular peltate tops, the connective in the centre the cells circumferential, dehiscing along the edge; filaments slender, shorter than the anthers; rudimentary pistil 0. *Female flowers* nearly ·5 in. in diam., axillary, solitary, sessile or shortly pedicellate. *Ovary* globose; stigma sessile, with large lobules, obscurely 4-lobed. *Fruit* globular, ·6 to ·75 in. in diam.; the pericarp thick, leathery; seeds about 4.

Perak, common. Malacca; Griffith (Kew Distrib. 859). Penang, Curtis, 1249.

This is not very different from *G. Choisyana*, Wall. to which indeed Pierre refers the Griffithian specimen 859. But Wallich's specimens of *G. Choisyana* have leaves of so much thinner texture that, on the strength

of this character alone, the two must be kept distinct. This species is readily known by its boldly 5 to -7-nerved leaves and hard, globular, small fruit.

28. *GARCINIA UROPHYLLA*, Scortechini MSS. A tree; the branchlets very slender, terete, yellowish. *Leaves* thinly coriaceous, ovate-lanceolate, caudate-acuminate, the base cuneate; both surfaces shining, the lower pale; nerves 4 to 5 pairs, ascending, distinct below when dry; length 2.25 to 3 in., breadth .7 to 1.2 in., petiole .15. *Male flowers* .2 in. in diam., solitary or in pairs, from small bracteolate axillary tubercles: buds globose, pedicels 1 in. or less; *sepals* 4, obtuse, sub-coriaceous, concave, subequal, ovate-orbicular; *petals* 4, orbicular, almost flat, very fleshy, much thickened near the base; *stamens* about 12, in a single group, with flat circular tops, the connective in the middle, and the anther round the edge dehiscing circumferentially; filaments thick, fleshy: rudimentary stigma 0. *Female flowers* axillary, solitary, sub-sessile: *sepals* and *petals* as in the male; staminodes about 6, free: *ovary* cylindric; *stigma* convex, boldly lobulate and deeply 4-cleft. *Fruit* ovoid-orbicular, .4 in. long by .35 in. in diam., smooth, crowned by the sessile lobulate stigma.

Perak; Scortechini Nos. 32^a, 723. Distrib. Sumatra; Beccari, No. 963.

In the size and shape of the leaves, this has a superficial resemblance to *G. rostrata*, *eugeniaefolia* and *merguensis*; but the nerves are only 4 or 5, while in these the nerves are numerous. Moreover the androecium of this is totally different.

29. *GARCINIA UNIFLORA*, King, n. sp. A small tree; the young branches rather stout, terete, of a dirty yellow when dry. *Leaves* ovate-oblong to elliptic-oblong, the apex abruptly shortly and sharply acuminate, the base cuneate; both surfaces dull, the lower pale and opaque; main nerves 12 to 20 pairs, thin, but rather prominent, the secondary nerves almost as distinct; length 5.5 to 7.5 in., breadth 2.5 to 4.25 in.; petiole .75 to 1 in. thick, channelled. *Male flowers* .75 in. in diam., solitary, sessile in the axils of fallen leaves, buds globular: *sepals* 4, sub-equal, obovate-orbicular, membranous, veined, concave; *petals* 4, orbicular, concave, fleshy, smaller than the sepals; *stamens* rather numerous, in an undivided globose mass; anthers sessile, peltate, or sub-globose with flat tops, dehiscing by a circular infra-marginal slit. *Female flowers* solitary and axillary like the males, and with a similar perianth; staminodes 0; stigma convex, deeply papillose; the ovary short, cylindric. Fruit unknown.

Perak; on Gunong Batu Puteh, at elevations of 3000 to 4000 feet, King's Collector 8081, Scortechini 364^b.

30. *GARCINIA DUMOSA*, King, n. sp. A shrub 3 or 4 feet high; young

branches 4-angled, yellow. *Leaves* thinly coriaceous, ovate-lanceolate to oblong-lanceolate, shortly caudate-acuminate, the base acute; both surfaces shining, the lower pale, opaque; nerves 7 to 9 pairs, bold and prominent beneath as are some of the secondary nerves; length 4·5 to 5·5 in., breadth 1·5 to 2 in., petiole ·25 in. *Male flowers* about ·2 in. in diam. in dense 6 to 10-flowered fascicles from small minutely bracteolate axillary tubercles; buds turbinate; pedicels slender, ·1 in. or less in length; *sepals* 4, membranous, orbicular, concave; the outer pair much smaller and thicker, keeled; *petals* 4, smaller than the sepals, fleshy, orbicular, concave: *stamens* from a small receptacle; filaments short; anthers broadly reniform, the connective expanded transversely, the cells sometimes confluent, bent round it, and dehiscing along the convexity; rudimentary stigma 0. *Female flowers* on axillary tubercles like the males, but fewer-flowered: *sepals* as in the male but subequal: *petals* as in the male; *staminodes* about 10, distinct, the filaments broad, the pseud-anthers flat, ovate: *stigma* convex with 8 radiating ridges, its margin 8-angled; *ovary* thick, cylindric, nearly as wide as the stigma. *Fruit* (*vide* Kunstler) ovoid, pointed.

Perak; at low elevations, Wray No. 2162, King's Collector, No. 2531.

Subgenus II. *XANTHOCHYMUS*, Roxb. (Gen.). *Sepals* and *petals* 5, very rarely 4. *Filaments* connate in 5, rarely in 4, erect distant pedicelled spathulate bodies, antheriferous at the top, free portions very short, incurved; anthers small, didymous.

31. *GARCINIA XANTHOCHYMUS*, Hook. fil. Fl. Br. Ind. I, 269. A medium-sized tree; the branches glabrous, angled. *Leaves* glabrous, shining; narrowly oblong or oblong-lanceolate, acute, the base cuneate; nerves numerous, not prominent; length 8 to 15 in., breadth 1·75 to 3·75 in., petiole about ·75 in. *Male flowers* ·5 to ·75 in. in diam., in 4-10-flowered fascicles, axillary or from the axils of fallen leaves, greenish-white; pedicels stout, ·5 to 1 in. long. *Sepals* ·25 in. in diam., orbicular, unequal, fleshy, concave. *Petals* ·35 in., orbicular, spreading, thin. *Stamens* in 5 broad bundles of 3 to 5, alternating with 5 fleshy glands: anthers 2-celled. *Hermap. flower* like the male, the pedicels 2 or 3 times as long. *Ovary* ovoid, pointed, usually 5-celled; *stigma* with 5, spreading, oblong blunt lobes. *Ripe fruit* globose, pointed, 2·5 in. in diam., dark yellow. *Seeds* 1 to 4, oblong. Kurz For. Flora Burma i, 93; Pierre Flore Forest. Cochinchine, fasc. VI, p. iii, t. 21 A. *Xanthochymus pictorius*, Roxb. Corom. Pl. ii, 51, t. 196; Fl. Ind. ii, 633. *X. tinctorius*, DC. Prodr. i, 562; Chois. Guttif. Ind. 32; Planch. and Triana Mem. Guttif. 149; W. and A. Prodr. 102; Wall. Cat. 4837, except C.

Andamans, Penang. Distrib. Burmah and Chittagong, base of E. Himalaya and Assam, S. India up to 1500 feet.

Sheet C of No. 4837 of Wall. Cat. (said to have been collected in Penang) does not in my opinion belong to this species. Its leaves have too few nerves.

32. *GARCINIA NERVOSA*, Miq. Ann. Mus. Lugd. Bat. I, 208. A tree 40 to 80 feet high: young branches stout, compressed, 4-angled, 2 of the angles winged. *Leaves* large, glabrous, very coriaceous, oblong-oblanccolate or oblong-ovate, sub-acute or obtuse, slightly narrowed below to the rounded or minutely cordate base; upper surface shining; the lower dull, pale; main nerves bold, numerous, anastomising $\cdot 1$ in. within the margin with the bold intra-marginal nerve: secondary nerves and reticulations rather prominent: length 9 to 20 in., breadth 3·5 to 7 in., petiole 1·25 in. *Male flowers* unknown. *Female flowers* $\cdot 75$ in. in diam., in axillary fascicles of 8 to 10; pedicels thickened upwards, 1 to 1·25 in. long, (longer in the fruit). *Sepals* 5, unequal, orbicular, much imbricate and very concave, very coriaceous, pubescent externally. *Petals* 5, much larger than the sepals, orbicular, concave, thin. Disk of 5 thick, fleshy, pitted glands with 5 minute staminodes between them each bearing 4·5 minute anthers. *Ovary* ovoid, narrowed into a distinct 5-rayed style, 5-celled. *Ripe fruit* ovoid or obovoid, yellow with red blotches, 2 in. long and 1·5 in. in diam., with a large eccentric mammilla crowned by the persistent 5-lobed stigma. *Seeds* about 2, elongate-ovoid. *G. Andersoni*, Hook. fil. Fl. Br. Ind. I, 270, 715; *Stalagmites? nervosa*, Miq. Fl. Ind. Bat. Suppl. 496.

Perak; King's Collector 10491, Scortechini. Malacca; Maingay (Kew Distrib. 157). Distrib. Sumatra.

Var. *pubescens*. *Leaves* densely and minutely pubescent below, cordate and slightly unequal at the base, 15 to 24 in. long, the edges recurved when dry; petiole triquetrous, very stout. Fruit bright yellow, 3 in. long, 2 in. in diam., the mammilla about $\cdot 75$ in.

Perak: King's collector, No. 3197.

This may be separable as a species when further material shall be forthcoming. Male flowers are unknown.

33. *GARCINIA DULCIS*, Kurz For. Flora Burmah I, 92. A tree 30 to 40 feet high: the young branches 4-angled, pale yellow. *Leaves* oblong to ovate-oblong, with an abrupt short sharp point, the base rounded or slightly narrowed; upper surface shining, the lower slightly pale and dull when dry, the midrib rather prominent on both; main nerves about 10 pairs, interarching near the margin, not much more prominent than the intermediate nerves; length 5 to 10 in., breadth 1·75 to 4·5 in.; petiole $\cdot 4$ to $\cdot 6$ in., stout. *Flowers* globular, hardly expanding, about $\cdot 25$ in. in diam., male and hermaphrodite mixed in dense many-flowered fascicles from small tubercles in the axils of the leaves or of the fallen

leaves; pedicels .25 to .35 in., *sepals* 4 to 6, usually 5, orbicular, unequal, fleshy, concave, the 3 outer smaller. *Petals* usually 5, larger than the sepals, orbicular, fleshy, concave; *Stamens* about 40, in 5, pedicelled, fan-shaped groups; filaments short, thick; anthers sub-globular, 2-celled, with sutural dehiscence; disk in the male depressed, truncate, corrugated, fleshy; in the female with 5 lobes which alternate with the staminal groups. *Stigma* in the male absent; in the hermaphrodite 5-rayed, the ovary ovoid-globular. *Fruit* 2.5 in. long, from globular to pear-shaped, pedunculate, smooth, yellow, with much sweet pulp; seeds 1 to 5, oblong, pointed; pedicels 1 in. Pierre Flor. Forest. Cochin-Chine, fasc. VI, p. iv. *Xanthochymus dulcis*, Roxb. Cor. Pl. t. 270; Wight Ic. 270; Bot. Mag. 3088; Choisy Gutt. Ind. 32; Planch. and Triana Mem. Guttif. 149. *Garcinia elliptica*, Choisy in DC. Prod. i, 561 (not of Wall. Cat.) *X. Javensis*, Blume Bijdr. 216; *Stalagmites dulcis*, Cambess. Mem. Mus. xvi. 392, 425; Miq. Fl. Ind. Bat. I, Pt. 2, 508; Hassk. Pl. Jav. Rar. 275.

Perak; King's Collector No. 5750. Distrib. Malayan Archipelago.

34. *GARCINIA ANDAMANICA*, King, n. sp. A tree from 20 to 40 feet high; young branches 4-angled, pubescent. *Leaves* elongate-ovate, often inequilateral, sub-acute; the base broad, rounded or slightly cordate; both surfaces glabrous, shining; main nerves 14 to 16 pairs, rather prominent; length 8 to 11 in., breadth 4 to 5.5; petiole .5 in., stout. *Male flowers* about .3 in. in diam., in short dense axillary fascicles from short wart-like branches. *Sepals* 5, coriaceous, ovate-rotund, imbricate, pubescent externally. *Petals* 5, larger than the sepals, thin, rotund, clawed, imbricate, glabrous. *Stamens* indefinite, in 5 thick fleshy bundles; anthers minute, sub-globular, introrse. *Disk* of 5 broad corrugated glands much shorter than the bundles of stamens and alternating with them. *Pistil* 0. *Female flower* unknown. *Fruit* globular or oval, smooth, bright yellow, 1 to 1.5 in. long and .75 to 1.25 in. in diam., shortly apiculate; the 5-lobed stigma persistent. *G. dulcis*, Kurz (not of Roxb.) For. Flora Burma i, 92; Pierre Fl. Forest. Cochin-Chine, fasc. vi, p. VI, *in part*.

Andaman Islands; Helfer No. 872, Kurz, King's Collector, No. 224.

Var. *pubescens*, leaves shortly pubescent beneath, the base cuneate. Andamans; King's Collector, No. 136.

This species was considered by Kurz to be identical with *Xanthochymus dulcis*, Roxb., a native of the Moluccas cultivated in the Botanical Gardens, Calcutta. It does not, however, agree with specimens still in cultivation there, nor with Roxburgh's description. Pierre (l. c.) expresses his doubt as to the identity of the Andaman and Molucca plants:

but he adopts Kurz's name for the latter. The variety named above *pubescens* may turn out to be a distinct species. At present only fruiting specimens of it are known. This species is closely allied to *G. Villersiana*, Pierre, a common Cambodian plant. The leaves of the latter, as shown in Pierre's figure (Fl. Forest Cochinchine, t. 21) have however more nerves; the flowers have longer pedicels, and the staminal bundles are longer and more slender than in this species: the lobes of the disk are also narrower and longer.

This is the Helferian plant referred to under *G. Xanthochymus* in Fl. Br. Ind. i, 269, as allied to, but differing from that species.

35. *GARCINIA DENSIFLORA*, King, n. sp. A tree 60 to 80 feet high: young branches stout, 4-angled, brown when dry. *Leaves* thickly coriaceous, broadly elliptic to elliptic-oblong, sub-acute or rather blunt, the base cuneate; both surfaces shining; the midrib stout: nerves 10 to 12 pairs, sub-horizontal, anastomosing by arches .1 in. from the margin; length 4.5 to 6 in., breadth 2.5 to 3.75 in.; petiole .6 in., thick, deeply channelled. *Male flowers* .35 in. in diam., in large dense many-flowered clusters 1 to 1.5 in. in diam., on bracteolate tubercles from the axils of the fallen leaves; buds globose; pedicels unequal, from .2 to .35 in. long: *sepals* 5, the 3 outer smaller than the inner 2, orbicular, fleshy, concave, puberulous externally, the margins ciliolate; the inner 2 as large as the petals, glabrous, the margins ciliolate; *petals* 5, fleshy, orbicular, concave, yellow; *stamens* in 5 pedicelled, fan-shaped branches of about 12: filaments thick, fleshy; anthers with 2 orbicular, suturally dehiscent, cells: *Disk* large, fleshy, much corrugated, with 5 radiating lobes which alternate with the staminal groups; *rud. style* cylindric, corrugated; the stigma oblong, smooth, small. *Female flower* and *fruit* unknown.

Perak; at elevations under 1000 feet, King's Collector, No. 5933.

A very distinct species collected only once.

36. *GARCINIA PRAINIANA*, King n. sp. A small tree: young branches terete or compressed, not angled, pale yellowish. *Leaves* more or less broadly elliptic-oblong, narrowed to the rounded or slightly cordate base, shining on both surfaces; nerves 12 to 15 pairs, spreading, inter-arching submarginally, rather prominent beneath when dry; intermediate nerves prominent, bifurcating; the midrib stout; length 4.5 to 9 in., breadth 1.75 to 4 in.; petiole .25 in., stout. *Male flowers* .4 in. in diam., in dense, 6 to 12-flowered, bracteate, terminal cymes; bracts numerous, lanceolate, fleshy, keeled; pedicels thick, flat; *sepals* 5, fleshy, concave, orbicular; *petals* 5, darker in colour than the sepals, fleshy, concave, sub-orbicular: *stamens* numerous, in a 5-lobed annulus round the globose rudimentary ovary, 2-celled, with sutural dehiscence. *Female flowers* unknown. *Fruit* (young 1.3 in diam.) globular, pulpy, smooth, crowned

by the sessile smooth concave stigma: the sepals persistent at its base, coriaceous, concave, about .5 in. long.

Perak; at Kwala Dynong, Seortechini, No. 1796.

DOUBTFUL SPECIES.

GARCINIA JELINEKII, Kurz MSS. in Herb. Hort. Calc. A specimen with leaves like a *Garcinia* and detached fruit of a true *Garcinia* (No. 169 Exped. *Novara*), collected in the Nicobars by Dr. Jelinek, has been thus named in the Calcutta Herbarium. The material is too imperfect to be dealt with.

2. CALOPHYLLUM, Linn.

Trees. *Leaves* opposite, shining, coriaceous, with innumerable parallel slender veins at right angles to the midrib. *Flowers* polygamous, in numerous axillary or terminal panicles. *Sepals* and *petals* 4-12, imbricate in 2-3 series. *Stamens* very many, filaments filiform, often flexuous, free or connate below; anthers erect, 2-celled, dehiscence vertical. *Ovary* 1-celled; style slender, stigma peltate; ovule solitary, erect. *Drupe* with a crustaceous putamen. *Seed* erect, ovoid or globose; testa thin, or thick and spongy. Distrib. About 35 species, chiefly tropical Asiatic with a few American.

SERIES A. SEPALS 4. PETALS 0. (*Apoterium*, Bl.).

Flowers axillary, solitary or in pairs	...	1. <i>C. microphyllum</i> .
Flowers in axillary fascicles	...	2. <i>C. Kunstleri</i> .
Flowers in axillary racemes.		

Glabrous everywhere.

Leaves less than 5 in. long.

Leaves ovate or obovate-lanceolate, pedicels 2 or more times as long as the flowers; fruit ovoid	...	3. <i>pulcherrimum</i> .
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Leaves elliptic-oblong, pedicels as long as flowers, fruit yellowish: young branches yellowish	...	4. <i>Prainianum</i> .
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Leaves elliptic-lanceolate, pedicels not exceeding flowers, racemes very numerous: young branches brown	...	5. <i>floribundum</i> .
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Leaves more than 5 in. long	...	6. <i>spectabile</i> .
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Apices of young branches, petioles and inflorescence ferruginous-pubescent.

Leaves thinly coriaceous, lanceolate
or oblong-lanceolate; outer sepals
oblong: fruit globose or sub-
ovoid; racemes not bracteate ... 7. *amœnum*.

Leaves coriaceous, ovate to ovate-
elliptic: outer sepals obovate,
clawed: fruit globose; racemes
not bracteate ... 8. *retusum*.

Leaves coriaceous, narrowly elliptic,
blunt or retuse; racemes brac-
teate at base: fruit globose ... 9. *Curtisii*.

Young parts and leaves, except when
very old, softly ferruginous-tomentose 10. *molle*.

Flowers in terminal panicles ... 11. *canum*.

SERIES B. SEPAL 4. PETAL 4 OR MORE.

Leaves elliptic, rarely obovate, blunt or emargi-
nate, thinly coriaceous, fruit spherical ... 12. *Inophyllum*.

Leaves obovate, retuse or emarginate, thickly
coriaceous, fruit ovoid ... 13. *Inopylloide*.

Leaves oblong, acuminate.

Young leaves and inflorescence rufous... 14. *Wallichianum*.

All parts glabrous.

Leaves 4 to 6 in. long, flowers .35
in. in diam. Petals 4 ... 15. *Griffithii*.

Leaves 5 to 10 in. long; flowers 1
in. in diam. Petals 4. Fruit 5
in. long ... 16. *macrocarpum*.

Leaves 1.75 to 3 in. long: flowers
.5 in. in diam. Petals 4 to 6 ... 17. *venustum*.

1. CALOPHYLLUM MICROPHYLLUM, T. Anders. in Hook. Fl. Br. Ind. i,
272. A glabrous, much branched, very leafy shrub; youngest branches
4-angled. *Leaves* rigidly coriaceous, obovate-cuneate or obovate, obtuse
or retuse, much narrowed to the base; nerves slightly and equally pro-
minent on both surfaces; length .75 to 1.5 in., breadth .35 to .75 in.,
petiole .1 to .2 in. *Flowers* solitary or in pairs in the axils of the
younger leaves, minute; pedicels .15 to .25 in., slender, recurved, with
2 bracts at the base. *Sepals* sub-orbicular. *Fruit* pisiform, topped by
remains of style.

Mount Ophir, near the summit.

The leaves are not unlike these of *C. floribundum*, but the inflores-
cence is quite different.

2. *CALOPHYLLUM KUNSTLERI*, King, n. sp. A tree 40 to 60 feet high, all parts glabrous except the buds, the 4-angled young branches, and the petioles and lower part of rachis of inflorescence with its bracts which are ferruginous-pubescent. *Leaves* thinly coriaceous, narrowly elliptic-oblong, the apex obtusely acuminate, tapering in the lower third to the short stout petiole; both surfaces shining; the nerves very close together and like the midrib most distinct on the lower; length 3·5 to 5 in., breadth 1·25 to 1·4 in., petiole ·3 to ·4 in. Flowers in solitary fascicles from the axils of the older or of fallen leaves, about 1·5 in. long, 3-4-flowered; bracts at base of pedicel 4, ovate, boat-shaped. *Flowers* ·25 in. in diam.; the pedicels often very unequal, the uppermost 1 in. and about twice as long as the lower. *Sepals* 4, the outer pair obovate-oblong, the inner oblong, all obtuse. *Petals* 0. *Fruit*, (not ripe) ovoid or globular, glabrous; pericarp thick, crustaceous.

Perak; King's Collector, Nos. 5328, 5374, 5459.

A common species; varying a little as to the amount of pubescence on the branchlets and buds, and in the form of the fruit. Ripe fruit has not, however, yet been collected; and it may prove than when ripe the fruit is uniformly globular. The nervation is closer than in any other species that I have seen, and the surfaces of the leaves have a peculiarly lustrous sheen.

3. *CALOPHYLLUM PULCHERRIMUM*, Wall. Cat. 4848. A glabrous tree, 20 to 60 feet high; the young branches as thick as a crow-quill, 4-angled. *Leaves* thinly coriaceous, ovate or obovate-lanceolate, shortly and obtusely acuminate, much narrowed to the base; both surfaces shining; the edge a little thickened and undulate, the midrib stout; length 1·75 to 2·5 in., breadth ·8 to 1·2 in., petiole ·3 in. *Racemes* solitary, about half as long as the leaves, from the axils of the older leaves, lax, spreading, few-flowered. *Flowers* ·25 in. in diam.; pedicels very slender, about ·5 in. long. *Sepals* broadly ovate, the inner pair slightly larger and more membranous. *Ovary* globose. *Fruit* ovoid with a very short beak, ·65 in. long. Choix. Guttif. Ind. 14; Planch. and Triana Mem. Guttif. 246; Hook. fil. Fl. Br. Ind. i, 271; Pierre Fl. Coch.-Chine, t. 104.

Singapore. Malacca. Perak. Distrib. Cochinchina.

Miquel's three species *bancanum*, *plicipes* and *gracile* are reduced to this in Hooker's Fl. Br. Ind. Miquel ascribes 4 petals to *gracile*, which would throw it into another section. Pierre (l. c.) expresses doubts as to *bancanum* and *gracile* falling here, and considers *C. plicipes* as totally distinct both as to leaves and flowers. Of *C. mesuaefolium*, (Wall. Cat. 4850,) only fragmentary specimens exist. In the Fl. Br. Ind. it is reduced here; but Planchon and Triana consider it quite different.

Var. *oblongifolium*, T. Anderson (in Hook. fil. Fl. Br. Ind. l. c.); leaves oblong, tip rounded.

4. *CALOPHYLLUM PRAINIANUM*, King, n. sp. A glabrous tree 40 to 60 feet high; the youngest branchlets polished, terete, yellowish. *Leaves* thinly coriaceous, elliptic-oblong, shortly sub-abruptly and obtusely acuminate, narrowed in the lower third to the short petiole; the nerves rather distinct on both surfaces; lower surface paler than upper, both shining; the edge pale yellow, very slightly thickened; length 2·5 to 4 in., breadth 1 to 1·5 in., petiole 2·5 to 4 in. *Racemes* solitary, axillary, rarely supra-axillary, about 1·5 in. long, ebracteate, lax, few-flowered. *Flowers* ·25 in. in diam.; pedicels slender, ·25 in., the upper rather longer. *Sepals* 4; the outer pair orbicular, concave, puberulous externally; the inner pair larger, imbricate, orbicular-oblong, glabrous. *Ovary* ovoid, stigma very broad. *Fruit* spherical, ·4 in. in diam., crowned by the thin style, pericarp thin.

Perak; King's Collector, Nos. 5366 and 7243.

Very like *C. pulcherrimum*, but with globular fruit: also like *C. Teysmannii*, but the nervation of the leaves in that species is unusually oblique for the genus, whereas in this the nerves are almost horizontal.

5. *CALOPHYLLUM FLORIBUNDUM*, Hook. fil. Fl. Br. Ind. I, 272. A tree? much branched and everywhere glabrous; branchlets glaucous, 4-angled, as thick as a crow-quill. *Leaves* coriaceous, elliptic-lanceolate, obtusely acuminate, the edges thickened and pale, the base acuminate, the numerous nerves and midrib most distinct on the under sub-glaucous surface, upper surface shining; length 1·24 to 1·5 in., breadth ·5 to ·6 in., petiole ·25 in. *Racemes* from most of the leaf-axils erecto-patent, more than half as long as the leaves; pedicels opposite, spreading, not much longer than the diameter of the flowers. *Flowers* ·25 in. in diam. The outer pair of *sepals* broadly ovate, sub-acute, the inner broadly obovate, blunt, membranous. *Stamens* numerous, style not longer than the sepals.

Malacca; Maingay, Nos. 170, 171.

This is closely allied to *C. pulcherrimum*, Wall., but has smaller leaves, the racemes are more numerous and longer in proportion to the leaves, while the pedicels of individual flowers are much shorter.

6. *CALOPHYLLUM SPECTABILE*, Willd. A tall tree; when adult all parts glabrous, the buds and young parts ferruginous-pubescent. *Leaves* thinly coriaceous, narrowly or broadly oblong, rarely elliptic, sub-acute or obtuse, undulate, the base cuneate; both surfaces shining, the nerves very numerous, the midrib strong; length 6 to 12 in., breadth 1·5 to 3 in., petiole ·5 to ·75 in. *Racemes* umbelliform, axillary, solitary, lax, few-flowered, ·5 in. in diam.; pedicels slender, ·5 in. *Sepals* orbicular, glabrous. *Ripe fruit* spherical, ·75 in. in diam. DC. Prod. i, 562; Choisy Guttif. Ind. 43, in part; Planch. and Triana Mem. Guttif. 238; Wight Ill. i, 128; Miq. Fl. Ind. Bat. i, Pt. 2, 510; Pierre Fl. Coch.-Chine, t.

107; Kurz Fl. Burm. i, 94; *C. tetrapetalum*, Roxb. Fl. Ind. ii, 608; *C. Moonii*, Wight Ill. i, 129, Ic. t. 111; Thw. Enum. 52; Beddome Flor. Sylvat. Gen. xxii; *C. cynosum*, Miquel Fl. Ind. Bat. Suppl. i, 497; *C. Diepenhorstii*, Miq. l. c. 497; *C. hirtellum*, Miq. Pl. Jungh. i, 291; Fl. Ind. Bat. I, Pt. 2, 511; *Apoterium Sulatri*, Bl. Bijdr. 218.

Penang, Singapore, Andamans, Nicobars. Distrib. Malayan Archipelago, Cochin-China, Fiji, Society Islands.

7. *CALOPHYLLUM AMOENUM*, Wall. Cat. 4849. A tree 20 to 40 feet high; the apices of the youngest branches, the buds, the leaf-petioles, and the rachides of the racemes minutely ferruginous or griseous-pubescent. *Leaves* thinly coriaceous, lanceolate or oblong-lanceolate, rarely ovate-lanceolate or obovate-elliptic, acute or very shortly and obtusely acuminate, the base cuneate; nerves very close, about equally prominent on both surfaces; length 2·5 to 3·5 in., breadth 1 to 1·5 in., petiole ·4 in. *Racemes* stout, sub-erect, shorter than the leaves, few-flowered. *Flowers* ·25 in. in diam., pedicels ·2 in. *Sepals* reflexed, the outer pair oblong, ferruginous-tomentose externally: the inner pair longer, sub-glabrous. *Fruit* globose or sub-ovoid, ·3 in. long, the pericarp pulpy. Choisy Guttif. de l'Inde, 41; Planch. and Triana Mem. Guttif. 235; Kurz Fl. Burm. i, 95.

Andamans; King's Collector. Tenasserim, Helfer, No. 881; Amherst Wallich, No. 4849.

None of the Andaman specimens which I have seen are in fruit; and none of the Burmese are in flower. But in leaf and other characters the specimens are alike. The species seems to me a good one and to be distinct from *C. retusum*, Wall., with which it has however been united in Fl. Br. Ind., and this is also the opinion of Planchon and Triana.

8. *CALOPHYLLUM RETUSUM*, Wall. Cat. 4846. A much-branched, very leafy shrub; the young branches 4-angled, softly ferruginous-pubescent, as are the petioles and inflorescence. *Leaves* coriaceous, ovate to ovate-elliptic, obtuse, the base rounded or slightly narrowed; nerves rather distant for the genus, more visible on the upper than on the lower surface; length 1·75 to 2·25 in., breadth ·8 to 1·1 in.; petiole ·2 in. stout, pubescent, when old glabrous. *Racemes* solitary, axillary, sub-erect, ferruginous-pubescent, especially at the base, 1 in. long. *Flowers* ·25 in. in diam., pedicels ·2 in. *Sepals*; the outer obovate, clawed; the inner ovate-oblong. *Fruit* pisiform. Pierre Fl. Coch.-Chine, t. 102; *C. pisiferum*, Planch. and Triana Mem. Guttif. 266; *C. retusum*, Hook. fil. Fl. Br. Ind. i, 272, (excl. syn. *C. amenum*, Wall.).

Malacca; Griffith, Maingay (Kew Distrib. No. 166). Singapore; Wallich, No. 4846.

9. *CALOPHYLLUM CURTISH*, King, n. sp. A tree; the young branches,

buds, petioles and inflorescence ferruginous-pubescent, sub-pulverulent. *Leaves* coriaceous, narrowly elliptic, blunt or retuse, the base narrowed; upper surface glabrous, shining; the lower rather dull, pubescent on the prominent midrib; the nerves rather distinct on both surfaces; length 2 to 2·75 in., breadth 1 to 1·4 in., petiole ·4 in. *Racemes* solitary or two together, axillary, umbellate, compact, 3 to 5-flowered, ferruginous-tomentose, much shorter than the leaves and with several navicular ferruginous-tomentose bracts at their base. *Flowers* ·25 in. in diam., the pedicels ·2 long, more than twice as long in fruit, and the uppermost the longest. *Sepals* 4; the outer oblong, sub-obovate, ferruginous-tomentose; the inner smaller, oblong, sub-glabrous. *Petals* 0. *Fruit* ovoid.

Penang; on Government Hill, at 500 feet, Curtis, No. 523.

A very distinct species ripe fruit of which is unknown.

10. *CALOPHYLLUM MOLLE*, King, n. sp. A tree 40 to 80 feet high; the young shoots, buds, under surfaces of adult leaves, and young fruit softly ferruginous-tomentose. *Leaves* coriaceous, narrowly oblong, gradually narrowed in the upper fourth to the sub-obtuse apex, the edges thickened and slightly recurved, the base rounded, or slightly narrowed; upper surface when adult sub-glabrous, the nerves close, slightly visible, the midrib sparsely and coarsely pubescent; lower surface pale and, except when very old, more or less softly tomentose especially on the very stout midrib: length 5 to 8 in., breadth 1·25 to 2·25 in., petiole ·4 in. to ·6 in. *Racemes* axillary, solitary, about 1 in. long, 1 to 2-flowered, densely ferruginous-tomentose as are the ovary and young fruit. *Sepals* 4, the outer oblong, ferruginous-tomentose externally. *Petals* 0. *Fruit* glo-bular, slightly apiculate, 1 in. long, sub-glabrous when ripe.

Penang; Curtis, No. 1426. Perak; King's Collector, many numbers.

A species collected by Sig. Beccari in Sumatra (P. S. 953) comes very near this; but the leaves are broader and more inclined to be oblanceolate, the thickening of the edge is greater and is pale in colour, while the young fruit is ovoid and not tomentose. Judging from Pierre's figure (he gives no description) of his *C. Dongnaiense*, Fl. Coch.-Chine, t. 108, that species and this must be near allies.

11. *CALOPHYLLUM CANUM*, Hook. fil. Fl. Br. Ind. i, 271. A tree 40 to 80 feet high; young branchlets as thick as a goose-quill, smooth. *Leaves* coriaceous, glabrous, narrowly elliptic-oblong, bluntly and shortly acuminate, slightly undulate, the base acute, upper surface shining, the lower less so; midrib very strong, nerves very thin and numerous; length 5 to 7 in., breadth 1·75 to 2·25 in., petiole ·5 to ·75 in. *Flowers* ·75 in., diam., in terminal hoary-pubescent panicles less than half as long as the leaves, or in axillary racemes, pedicels ·15 in. *Sepals* hoary-puberulous, orbicular; the outer pair coriaceous, concave; the inner pair larger and

thinner, imbricate, the upper edge incurved, ciliate. *Petals* 0. Stamens very numerous. *Stigma* discoid. *Ovary* depressed-spherical, glabrous. *Fruit* ovoid, smooth, .75 in. long.

Malacca; Maingay. Perak; King's Collector No. 5420, Scortechini No. 2044. Penang; Curtis, No. 1543. Distrib. Cochin-China, British India.

Not unlike *C. Wallichianum*, Planch. and Triana; but apetalous and the leaves never tomentose.

12. *CALOPHYLLUM INOPHYLLUM*, Linn. sp. 732. A glabrous tree 20 to 30 feet high: young branches stout. *Leaves* thinly coriaceous, elliptic, rarely obovate-oblong, apex rounded or emarginate, the base acute, shining on both surfaces; length 4 to 6 in., breadth 2.5 to 3.5 in., petiole .75 in. broad. *Racemes* in the upper axils, lax, 3 to 4 in. long, few-flowered. *Flowers* .75 in. in diam.; pedicels slender, 1 to 1.75 in. *Sepals* 4, the 2 inner petaloid. *Petals* 4, longer than the sepals. *Filaments* 4-delphous. *Ovary* stipitate, globose. *Style* longer than the stamens; stigma peltate, lobed. *Fruit* globular; the pericarp smooth, fleshy, 1 in. in diam. or more. DC. Prod. I, 562. Bl. Bijdr. 217. Chois. Guttif. Ind. 42. Planch. and Triana Mem. Guttif. 254. Roxb. Fl. Ind. ii, 606. W. and A. Prod. 103. Miq. Fl. Ind. Bat. I, pt. 2, p. 510. Wight Ill. i, 128; Ic. 77. Hook. Fl. B. Ind. i, 273. Kurz Fl. Burm. i, 95. *C. Blumei*, Wight Ill. i, 128. *C. Bintagor*, Roxb. Fl. Ind. ii, 607. (?)

On the Coasts, in all the Provinces. Distrib. Burmah, S. India and Ceylon, E. African Islands, Australia, Polynesia.

The pure white flowers are delightfully fragrant, the seeds yield a beautiful mild oil, and the wood is useful for spars of boats and ships.

13. *CALOPHYLLUM INOPHYLLOIDE*, King, n. sp. A glabrous tree, 60 to 80 feet high; the young branches about as thick as a goose-quill, dark brown. *Leaves* thickly coriaceous, obovate or obovate-oblong, the apex retuse or emarginate, the edges thickened, recurved (when dry), gradually narrowed from about the middle to the stout petiole; both surfaces shining, the lower less so and paler; nerves very numerous, little prominent, the midrib stout; length 3.25 to 4.5 in., breadth 1.75 to 2.75 in.; petiole .6 to .1 in., broad at the apex. *Racemes* from the axils of the upper leaves, 2 to 3 in. long, lax, few-flowered. *Flowers* globular in bud, about .75 in. in diam. when expanded. *Outer sepals* rotund, concave, reflexed, 4 in. long; the inner petaloid, larger than the outer. *Petals* narrower than the sepals: pedicels slender, .65 to 1 in. long. *Style* stout; stigma broad, discoid. *Fruit* (not quite ripe) ovoid, .75 in. long, the pericarp not pulpy.

Perak; on low Hills, elevation 300 to 500 feet.

The leaves of this much resemble those of *C. Inophyllum*, but they

are thicker, smaller, and invariably obovate and retuse. The flowers are smaller than those of *C. Inophyllum*; the fruit also differs in being smaller, ovoid and not pulpy. This species also resembles the British Indian *C. Wightianum*, Wall. The existence of petals is certain, but the condition of the flowers on the only specimens hitherto collected is such that their number cannot be made out with certainty.

14. *CALOPHYLLUM WALLICHIANUM*, Planch. and Triana Mem. Gutt. 249. A tree; the branchlets pale yellowish, the youngest 4-angled and, with the buds under surface of young leaves and inflorescence, minutely ferruginous-tomentose. *Leaves* thinly coriaceous, narrowly elliptic-oblong, the apex shortly and obtusely acuminate, the base acute; upper surface shining, the midrib narrow; lower surface dull, the midrib prominent, at first minutely ferruginous-tomentose, when adult glabrous: length 4·5 to 6 in., breadth 1·5 in.; petiole ·75 in., rusty. *Racemes* axillary and terminal, less than half as long as the leaves, ferruginous-tomentose, erecto-patent. *Flowers* ·5 in. in diam., pedicels ·2 in. *Sepals* 4, orbicular, ferruginous-tomentose on both surfaces. *Petals* 4, euneate-oblong, glabrous internally. Fruit (*vide* F. B. Ind.) globose, the size of a cherry. Wall. Cat. No. 4843, in part. Hook. fil. Fl. Br. Ind. i, 273.

Malacca; Maingay.

This species was founded by Planchon and Triana on a specimen mixed with Wall. Cat. No. 4843, (the bulk of which is *C. spectabile*, Willd.) This does not appear to be a common species, and its fruit I have not seen. It may be readily distinguished by its yellow branches, the pale ferruginous, almost cinnamonaceous, colour of its leaves when dry, and its darkly rusty racemes.

15. *CALOPHYLLUM GRIFFITHII*, T. Anders. in Hook. Fl. Br. Ind. i, 273. A glabrous tree, the youngest shoots 4-sided. *Leaves* thinly coriaceous, oblong or elliptic-oblong, acute or obtuse, the base shortly cuneate, shining on both surfaces, the rather distant nerves equally distinct on both, the midrib more distinct and pale-coloured on the lower; the edges with a pale thickening; length 4 to 6 in., breadth 1·75 to 2 in., petiole ·4 to ·6 in. *Racemes* solitary, axillary, from 1·5 to 2·5 in. long, few-flowered. *Flowers* ·35 in. in diam., glabrous; pedicels unequal, ·2 to ·5 in. long, slender, each with a small deciduous bract at its base. *Sepals* 4, outer pair orbicular, inner pair longer but narrower. *Petals* 4, oblong, obtuse. *Fruit* (young) ovoid, smooth.

Malacca; Griffith. Distrib. Sumatra, Forbes, No. 322a.

16. *CALOPHYLLUM MACROCARPUM*, Hook. fil. Fl. Br. Ind. I, 273. A glabrous tree; branchlets polished, sharply 4-angled. *Leaves* coriaceous, narrowly oblong or elliptic-lanceolate, shortly and obtusely acuminate,

much narrowed at the base, edge slightly thickened, upper surface shining, the midrib prominent on the rather dull lower surface, nerves rather bold and equally prominent on both; length 5 to 10 in., breadth 2 to 3 in., petiole 1 to 1·25 in. *Racemes* not half the length of the leaves, axillary, solitary, 6-10 flowered, minutely ferruginous-puberulous. *Flowers* 1 in. in diam.; pedicels 1 to 1·25 in. *Sepals* 4, the outer pair puberulous externally; the inner pair larger, imbricate, oblong-rotund, orbicular, concave, rusty, obtuse, petaloid. *Petals* 4, smaller than the inner sepals, oblanceolate, clawed. *Stamens* short. *Fruit* (*vide* Maingay) ellipsoid, 5 in. long.

Malacca; Maingay (Kew Distrib. 174). Perak; King's Collector, No. 8851.

17. *CALOPHYLLUM VENUSTUM*, King, n. sp. A glabrous tree, 20 to 30 feet high. *Leaves* thinly coriaceous, shining, rigid, elliptic-ovate, retuse, the base cuneate, the margin thickened; nerves rather distant for the genus and equally distinct on both surfaces; length 1·75 to 3 in., breadth 1 to 1·5 in., petiole ·3 to ·4 in. *Racemes* 3-5 flowered, solitary, axillary, half as long as the leaves, very lax, spreading. *Flowers* large (·5 in. in diam.), on long (·75 in.) pedicels; buds ovoid. *Sepals* 4, more or less orbicular. *Petals* 4 to 6, narrower than the sepals, the inner oblong, veined, all obtuse. *Fruit* unknown.

Perak; King's Collector, No. 7763.

A very handsome species of which the fruit is unknown. In leaf it resembles *C. amatum*, but differs greatly in the flowers.

3. *KAYEA*, Wall.

Trees. *Leaves* opposite; veins rather distant, arched. *Flowers* hermaphrodite, either large and solitary, or small and collected in terminal panicles. *Sepals* and *petals* 4 each, imbricate. *Stamens* numerous, filaments slender, free or connate at the base; anthers small, subglobose, 2-celled, dehiscence vertical. *Ovary* 1-celled; style slender, stigma acutely 4-fid; ovules 4, erect. *Fruit* subdrupaceous, fleshy, indehiscent, 1-4-seeded. *Seeds* thick, testa thin and crustaceous.—Distrib. Tropical Asia, 7 species.

Flowers in racemes.

Racemes 2 to 3 in. long; flowers 1 in.

or more in diam. ... 1. *K. Wrayi*.

Racemes less than 1 in. long; flowers

less than 1 in. in diam. ... 2. *K. racemosa*.

Flowers solitary, axillary.

Nervation of leaves bold, distinct.

- Fruit turbinate, quite enveloped by
the outer sepals when ripe ... 3. *K. grandis*.
Fruit ovoid, pointed, only partly
covered by sepals.
Leaves tapering to the mo-
derately long petiole ... 4. *K. Kunstleri*.
Leaves rounded or cordate at
base, sub-sessile ... 5. *K. nervosa*.
Fruit ovoid with a much elongate
hooked apex, leaves caudate-
acuminate ... 6. *K. caudata*.
Nervation of leaves indistinct.
Young branches slender, smooth,
flowers axillary ... 7. *K. elegans*.

1. *KAYEA WRAYI*, King, n. sp. A small glabrous tree; the young branches pale, polished, terete, often whorled. *Leaves* very thickly coriaceous, broadly elliptic, acute or acuminate, the edges much recurved when dry, the base rounded; nerves about 15 pairs, unequal, only slightly prominent on the lower and less so on the upper surface; both surfaces smooth, the upper shining, the lower dull; length 3 to 4.5 in., breadth 1.75 to 2.25 in.; petiole .4 in., thick. *Racemes* axillary or terminal, 2 to 3 in. long, sub-erect, stout, with minute subulate bracts at the base, 3 to 5-flowered. *Flowers* 1 to 1.25 in. in diam., pedicels .5 to 1.25 in. long. *Sepals* orbicular, nearly equal, glabrous, the outer pair coriaceous, the inner thinner. *Petals* much larger than the sepals, broadly-obovate or orbicular, clawed. *Stamens* much shorter than the petals. *Fruit* unknown.

Pahang; on Gunong Brumber, elevation 7000 feet, L. Wray, junior.

A remarkable species quite unlike any hitherto described.

2. *KAYEA RACEMOSA*, Planch. and Triana Mem. Guttif. 269. A glabrous tree, 40 to 60 feet high. *Leaves* sub-coriaceous, elliptic-oblong, with a very short blunt acumen, slightly narrowed to the petiole; upper surface rather dull, the lower paler and shining; main nerves 18 to 25 pairs, bold, spreading; length 6 to 9 in., breadth 1.5 to 2.5 in.; petiole .75 in., stout. *Racemes* less than 1 in. long, few-flowered, bracteolate, crowded at the apices, or in the axils near the apices, of the rather long naked often whorled branchlets; pedicels stout, .15 in. long. *Flowers* .5 in. in diam. *Sepals* rotund, thickly coriaceous. *Petals* longer than the sepals, thin. *Stamens* numerous, in one series, monodelphous at the base; Wall. Cat. without number or locality; Hook. fil. Fl. Br. Ind. i, 276, (excl. syn. *Mesua Singaporiana*, Wall. Cat. 4836.)

Malacca; Maingay (Kew Distrib. 177). Perak; Scortechini, 97.

The foregoing description has been drawn up from Maingay's Malacca specimens above quoted, which have been accepted by Sir Joseph Hooker as of the species described by Planchon and Triana as *K. racemosa*. These authors founded the species on a Wallichian specimen in M. de Candolle's Herbarium, without number or indication of locality, which had been separated from some other Wallichian number, and which bears the following note by Choisy "*Mesua speciosa? specimen imperfectum sine notula in herb. Wallichiano repertum.*" This specimen I have not seen. Of Wall. Cat. No. 4836, (*Mesua Singaporiana*.) there is a specimen in Herb. Cal.; and it is certainly different from Maingay's 177, being more like a *Mesua* than a *Kayea*.

3. *KAYEA GRANDIS*, King, n. sp. A glabrous tree, 40 to 80 feet high. *Leaves* large, coriaceous, oblong to elliptic-oblong, sub-acute, the edges revolute (when dry), slightly narrowed towards the rounded or sub-acute base; both surfaces rather dull (when dry), the 20 to 25 pairs of main nerves sub-horizontal, prominent, the secondary nerves also prominent; length 9 to 18 in., breadth 3 to 4·5 in.; petiole ¼ to ¾ in., smooth. *Flowers* sub-globose in bud, pedicelled, in short few-flowered axillary cymes crowded in the axils of the leaves, rarely solitary, about 1·25 in. in diam. when expanded; pedicels ½ in. *Sepals* rotund, the outer concave very coriaceous; the inner thin, not larger than the outer. *Petals* elliptic-oblong, acute, larger than the sepals (½ in. long or more). *Ripe fruit* turbinate, 2 to 2·5 in. in diam. and 1·25 in. thick, leathery, completely enveloped by the persistent, thickened, outer sepals.

Malacca; Maingay (Kew Distrib. 178), Cantlay No. 2354. Perak, King's Collector.

A very fine species; at once distinguished by its large leaves and depressed turbinate fruit. The fruit, and probably the whole plant, abounds in yellow juice. According to M. Cantley the wood sinks in water.

4. *KAYEA KUNSTLERI*, King, n. sp. A glabrous tree, 30 to 50 feet high; the branchlets brownish, sub-striate, not tuberculate. *Leaves* thinly coriaceous, elliptic-lanceolate, acuminate, sub-undulate, the base much narrowed to petiole; both surfaces rather dull (when dry) with a few scattered opaque black dots; the lower pale, sub-glaucous (when dry); length 4 to 6 in., breadth 1 to 2·25 in.; petiole ¼ in. to ¼ in., rugose; nerves 20 to 24 pairs, unequal, prominent; the lower horizontal, the upper slightly curving upwards. *Flower* solitary, axillary or terminal, 1·5 to 2 in. diam., on a very short smooth pedicel, bracts at its base linear-subulate: bud globose, smooth. *Sepals* unequal as in *nervosa*. *Petals* oblong-acuminate, 1 in. long. *Ripe fruit* ovoid, gradually narrowing into a short subulate apical beak.

Perak: King's Collector, Nos. 3301, 6850: Penang, Curtis, No. 1419; Malacca, Maingay, No. 173.

This is allied to *K. nervosa*, T. Anders.; but it is readily distinguished from that by its smooth branchlets, by the leaves much and gradually narrowed to both base and apex, and by the oblong-acuminate petals. A shrubby form of this occurs in Penang (Curtis, Nos. 805, 1418,) and in Perak (King's Collector, No. 1345) in which all the parts are smaller and the leaves are less acuminate at the apex, and rounded instead of much attenuated at the base.

5. *KAYEA NERVOSA*, T. Anders. in Hook. fil. Fl., Br. Ind. i, 277. A glabrous tree; the branchlets minutely tubercled, 4-angled. *Leaves* subsessile, membranous, elliptic-oblong, shortly and bluntly acuminate, the base rounded or emarginate; both surfaces (when dry) dull coppery brown, the lower paler; nerves 16 to 20, unequal, rather prominent beneath; length 3 to 5 in., breadth 1·25 in. to 2 in.; petiole ·15 in. long, rugose as is the base of the midrib. *Flowers* axillary, usually solitary (sometimes 2 or 3 from an axil), or terminal, 1·75 in. in diam.; pedicels ·75 in. or less, tubercled, each with several linear lanceolate bracts at its base. *Sepals* unequal, the outer very coriaceous, sub-orbicular; the inner nearly twice as large but thinner. *Petals* obovate; filaments about as long as the slender pistil. *Ripe fruit* sub-globular, beaked, leathery, ·75 in. in diam. or more, the calyx marcescent. Kurz Flora Burm. i, 96; *Mesua nervosa*, Pl. and Triana Mem. Guttif. 279.

Malacca, Perak. Distrib. Burmah.

6. *KAYEA CAUDATA*, King, n. sp. A slender glabrous tree, 20 to 30 feet high, with drooping habit; the branchlets slender, pale brown, striate. *Leaves* membranous, obovate-elliptic, caudate-acuminate, mucronulate, edges undulate, slightly narrowed to the rounded base; both surfaces dull, the lower pale; nerves 12 to 14 pairs, prominent, sub-horizontal; length 3 to 3·5 in. of which the acumen forms ·7 in.; breadth 1 to 1·15 in., petiole ·15 in. *Flowers* unknown. *Fruit* solitary, terminal, shortly pedicellate, narrowly ovoid-cylindric, tapering very much to the apex and often curved, less narrowed to the base, 2 to 2·5 in. long, and 1 to 1·25 in. in diam. at the middle; bracts at base of pedicel subulate, 1-nerved. *Sepals* persistent, the outer pair orbicular, the inner oblong; pedicel about ·2 in. long, rather shorter than the subulate bracts.

Perak; King's Collector, No. 7937.

Only once collected and only in fruit. Easily recognisable by its caudate-acuminate leaves and fruit.

7. *KAYEA ELEGANS*, King, n. sp. A glabrous tree 40 to 60 feet high, with slender drooping branches; branchlets very thin, pale gray. *Leaves* thinly but rigidly coriaceous, lanceolate, acuminate, the base acute, the

edges undulate (when dry); both surfaces rather dull, the nerves numerous but indistinct, the midrib slightly prominent; length 2·25 to 3 in., breadth ·5 to ·75 in., petiole ·25 to ·35 in. *Flower* solitary, axillary or terminal, 4 in. in diam.; pedicel ·1 in. long with several ovate-acute bracts at its base. *Sepals* nearly equal, the outer coriaceous. *Petals* oblong, acute, smaller than the sepals. *Ovary* narrowly ovoid, attenuate above, and passing into the long filiform curving exserted style. *Fruit* unknown.

Perak; on Gunong Bubu, elevation from 1500 to 2000 feet. King's Collector.

A very distinct and elegant species, distinguished by its thin rigid lanceolate leaves and very slender branches.

4 MESUA, Linn.

Trees. *Leaves* opposite, rigidly coriaceous, often pellucid-dotted; veins very numerous, very slender, at right angles to the midrib. *Flowers* polygamous or hermaphrodite, large, axillary or terminal, solitary. *Sepals* and *petals* 4 each, imbricate. *Stamens* very numerous, filaments filiform, free or connate at the base; anthers erect, oblong, 2-celled, dehiscence vertical. *Ovary* 2 celled; style long, stigma peltate; ovules 2 in each cell, erect. *Fruit* between fleshy and woody, 1 celled by the absorption of the septum, at length 4-valved, 1-4-seeded. *Seeds* without an aril, testa fragile. Distrib. Tropical Asia; 3 species.

1. *MESUA FERREA*, Linn. sp. 734. A medium sized tree with spreading head; branches faintly 4-angled, glaucous. *Leaves* coriaceous, linear-lanceolate to oblong-lanceolate, acute or acuminate, the base acute or rounded; above shining; below pruinose, glaucous or glaucescent; nerves numerous, close, inconspicuous; length 3 to 6 in., breadth ·75 to 1·25 in., petiole ·25 to ·35 in. *Flowers* ·75 to 3 in. in diam., in pairs or solitary, usually terminal. *Sepals* orbicular, fleshy, the margins thin. *Petals* 4, obovate, white; anthers large, elongate. *Fruit* ovoid-conic to subglobose, from 1 to 2 in. long, the sepals persistent. Choisy in DC. Prod. i. 562; Choisy Guttif. Ind. 40; Planch. and Triana Mem. Guttif. 271; Roxb. Fl. Ind. ii. 635; W. and A. Prod. 102; Wall. Cat. 4834; Wight Ill. 127, Ic. t. 118; Beddome Flor. Sylvat. Gen. xxiii; Hook. fil. Fl. Ind. i. 277; Bl. Bijdr. 216; Miq. Fl. Ind. Bat. i, Pt. 1, 509; Kurz For. Fl. Burm. i, 97; *M. speciosa*, Choisy in DC. l. c.; Guttif. Ind. 40; Wight Ic. t. 118 and 961; Wall. Cat. 4835; Pl. and Trian. l. c. 375; Beddome l. c. xxiii. *M. pedunculata*, Wight Ill. 127; Ic. t. 119. *M. coromandeliana*, Wight Ill. 129; Ic. t. 117; Pl. and Trian. l. c. 378; Beddome Flor. Sylvat. t. 64. *M. Roxburghii*, Wight Ill. 127; Beddome l. c. xxiii. *M. salicina*, *M. Walkeriana* and *M. pulchella*, Planch. and Trian. l. c. 373,

374, and 379. *M. sclerophylla*, Thwaites Enum. 407; Beddome l. c., xxiii. *M. Nagana*, Gard. in Calc. Journ. Nat. Hist. vii, 4.

In all the Provinces. Distrib. Eastern and Southern provinces of British India; Ceylon: often cultivated.

A variable species to which many names have been given. A form with narrow leaves (.5 in. broad) and small flowers is found in Ceylon, and was distinguished by Thwaites as var. *angustifolia* (*M. salicina*, Pl. and Tri.). In other forms from Ceylon and the South of India, the leaves have very little of the characteristic white waxy powder on their under surfaces; and these formed the bases of Planchon and Triana's species *M. pulchella*, and of Wight's *M. Coromandeliana*.

2. *MESUA LEPIDOTA*, T. Anders. in Hook. fil. Fl. Br. Ind. I, 288. A slender glabrous tree, 60 to 80 feet high; the branches pale brown, the youngest minutely rugose when dry. *Leaves* coriaceous, shining, narrowly elliptic or oblong-lanceolate, the apex shortly acuminate, the base acute; lower surface pale, nerves indistinguishable but the midrib prominent on both surfaces; length 2 to 3 in., breadth .75 to 1.2 in., petiole .15 in. *Flowers* unknown. *Fruit* solitary, terminal, pedicellate, broadly ovoid or depressed-globular when young, slightly pointed when mature, apiculate, 1 in. or more in diam., subtended at the base by the 4 lignified sub-rotund spreading sepals: pericarp thick, woody, rugulose, dehiscing vertically by 2 (rarely 3) pointed valves. *Seeds* two, plano-convex, or one depressed-globose; the testa brown, brittle; pedicels 1 to 1.5 in. long, thickened upwards, and with several minute subulate deciduous bracts at their bases.

Malacca; Griffith (Kew Distrib. No. 845). Perak; Scortechini, No. 183^b, King's Collector, Nos. 4551 and 5881.

It is suggested in Fl. Br. Ind. (I, 278) that Griffith's No. 845, although now put with *Mesua*, is probably the type of a new genus between *Kayea* and *Mesua*. Griffith's specimens have no flowers, and unfortunately neither have those of the Perak collectors. The latter appear to belong to the same plant as Griffith's; but their leaves are rather smaller, the branchlets more slender, and the pericarp slightly thinner. It may therefore be found, when fuller material is forthcoming, that there are two species here, and that neither belongs to *Mesua*.

ORDER XV. TERNSTROMIACEÆ.

Shrubs rarely climbing, or trees. *Leaves* alternate, simple (in Indian species) entire or often serrate, usually coriaceous, exstipulate. *Flowers* handsome, seldom small, usually subtended by 2 sepal-like bracts, rarely declinous, axillary, 1 or more together, rarely in lateral or terminal racemes or panicles. *Sepals* 5, rarely 4-7, free or slightly con-

nate, the innermost often larger. *Petals* 5, rarely 4-9, free or connate below, imbricate or contorted. *Stamens* numerous (definite in *Sladenia* and *Stachyurus*) free or connate, usually adnate to the base of the deciduous corolla; anthers basifixed or versatile, dehiscent by slits or rarely by terminal pores. *Ovary* free ($\frac{1}{2}$ -inferior in *Anneslea*), sessile, 3-5-celled, (many-celled in *Actinidia*); styles as many, free or connate, stigmas usually small; ovules 2-8 in each cell, rarely solitary, never orthotropous. *Fruit* baccate or capsular. *Seeds* few or numerous, placentas axile; albumen scanty or 0, rarely copious; embryo straight or hippocrepiform, cotyledons various. Distrib. Rare in temperate, abundant in tropical Asia and America, almost wanting in Africa and entirely in Australasia; species about 270.

Tribe I. TERNSTREMIÆ. *Peduncles* 1-flowered. *Petals* imbricate. *Stamens* adherent to the base of the corolla; anthers basifixed. *Fruit* (in Indian genera) indehiscent. *Seeds* usually few; albumen fleshy, usually scanty. *Embryo* curved; cotyledons shorter than the radicle and about as broad.

* Fruit inferior.

1. *Anneslea*.

** Fruit superior.

Flowers hermaphrodite.

Anthers usually pilose, stamens and
seeds numerous, ovary 3-5-celled

2. *Adinandra*.

Flowers diœcious.

Flowers large, on long pedicels ... 3. *Ternstroemia*.

Flowers small, sessile or sub-sessile ... 4. *Eurya*.

Tribe II. SAURAUJÆ. *Peduncles* many-flowered. *Petals* imbricate. *Anthers* versatile. *Fruit* usually pulpy, rarely sub-dehiscent. *Seeds* numerous, minute, albumen abundant. *Radicle* straight or slightly curved and longer than the cotyledons.

Climbers, diœcious .. 5. *Actinidia*.

Trees or shrubs; usually hermaphrodite ... 6. *Saurauja*.

Tribe III. GORDONIÆ. *Peduncles* 1-flowered, often very short. *Petals* imbricate. *Anthers* versatile. *Fruit* indehiscent or loculicidal. *Albumen* scanty or 0. *Cotyledons* various; radicle short, straight or curved.

* Fruit indehiscent.

7. *Pyrenaria*.

** Fruit dehiscent.

Ovules lateral, seeds winged, radicle inferior ... 8. *Schima*.

Ovules pendulous, seeds winged, radicle superior ... 9. *Gordonia*.

Tribe IV. BONNATIEÆ. *Flowers* in lateral panicles crowded near the apices of the branches.

Anthers versatile; *capsule* dehiscing from base.... 10. *Archytaea*.

1. ANNESLEA, Wall.

Evergreen glabrous trees or shrubs. *Flowers* in terminal corymbs, large, white, 2-bracteolate. *Sepals*, 5, their lower part fleshy, connate, and adherent to the ovary, their upper part coriaceous and crowning the fruit. *Petals* 5, connate by their bases. *Stamens* numerous; the filaments short, inserted on the torus; anthers narrow, elongate, 2-celled, introrse, with a long apiculus from the connective. *Ovary* half immersed in the torus, 3-celled; style cylindric, 3-fid: ovules many, pendulous. *Fruit* a leathery inferior berry crowned by the sepals. *Seeds* oblong, flattened, emarginate at one end, with a hard testa and fleshy albumen. Distrib. Burmah and Malayan Peninsula: species 2.

ANNESLEA CRASSIPES, Hook. in Choisy Mem. Ternst. 41. A bush or small tree; young branches stout, the bark rough, rather pale. *Leaves* coriaceous, obovate or oblanceolate with short abrupt blunt acumen, or oblong-lanceolate and acute, much narrowed at the base; the edge thickened and obscurely glandular-serrate; nerves 6 to 8 pairs, invisible in the fresh, faint in the dry state, the midrib prominent in both: length 2·5 to 6 in., breadth 1·5 to 2·25 in., petiole ·6 to 1 in. *Flowers* 1 to 1·25 in. in diam., in corymbs of 3 to 6; pedicels ·5 to 1·25 in., recurved; bracteoles fleshy, square, keeled. Free portion of *sepals* fleshy, ·65 in. long, yellow, rounded or emarginate. *Petals* smaller than the sepals, membranous, ovate-acuminate. *Stamens* about 30. *Fruit* ovoid, 1 to 1·5 in. long (excluding the free part of the sepals), rough; style persistent. Hook. fil. Fl. Br. Ind. i, 280.

Mount Ophir in Malacca; Griffith &c.—Perak; on Gunong Batu Puteh at 3,400 ft., Wray, Scortechini.

Var. *obovata*. A bush. *Leaves* obovate, minutely and bluntly mucronate; *fruit* conspicuously verrucose.

Perak, Gunong Bateh, at an elevation of 6,700 feet.

Anneslea is practically a *Ternstræmia* with half inferior fruit.

2. ADINANDRA, Jack.

Small evergreen trees with the habit of *Ternstræmia* or *Gordonia*. *Peduncles* axillary, solitary, recurved, 2-bracteate at the apex. *Flowers* often silky outside. *Sepals* 5. *Petals* 5, connate at the base. *Stamens* many, often 1-4-delphous, the inner smaller; anther cells lateral, narrow, elongate, the connective apiculate, usually hairy. *Ovary* 3-5-celled; style ultimately elongate, entire or shortly 3-5-fid; ovules many

in each cell. *Fruit* globose, subtended by the persistent calyx and crowned by the style. *Seeds* many, small, albumen fleshy. Distrib. Confined (except the W. African *A. Mannii*) to the Malay Peninsula and Indian Archipelago; species 12.

1. *ADINANDRA DUMOSA*, Jack in Malay Misc. ii, No. 7, p. 50. A large shrub or small tree, glabrous everywhere except the stamens; young branches slender, terete, dark brown. *Leaves* coriaceous, glabrous, reddish beneath, oblong-lanceolate to elliptic, more or less acute or obtusely acuminate, the base narrowed; edges entire or obsoletely serrate; midrib prominent especially beneath, nerves invisible; length 2 to 4 in., breadth 1.25 to 1.75 in., petiole .1 to .2 in. *Flowers* .65 in. in diam., peduncles .4 to .75 in. long, not thickened after flowering; bracteoles leathery, broadly ovate, opposite, close to the calyx. *Sepals* sub-erect, glabrous, leathery, ovate-rotund, blunt, sometimes emarginate. *Petals* longer than the sepals, membranous, oblong-lanceolate with broad bases, the apex minutely apiculate, erect, conniving. *Stamens* about 30, the inner shorter: filaments united by their bases, pilose: *anthers* with 2 narrow lateral cells; the connective broad and pilose behind, its apex mucronate. Ovary 5-celled, the placentas incurved, multi-ovulate; style subulate: stigma small, simple. *Fruit* .4 to .5 in. in diam., baccate, dry, with coriaceous pericarp, imperfectly 4-5-celled. Seeds numerous, reniform. Wall. Cat. 3664, (corrected at p. 215 to 3666) and 7071. Dyer in Hook. fil. Fl. Ind. i, 282; Miq. Fl. Ind. Bat. i, Pt. 2, p. 477; Choisy Mem. Ternst. 24. *A. Jackiana* and *trichocoryna*, Korth. Verh. Nat. Gesch. Bot. 106, 107. *A. cyrtopoda*, *stylosa* and *glabra*, Miq. Flor. Ind. Bat. Suppl. i, 478, 479. *Ternstroemia? dumosa*, Wall. Cat. 2245. *Camellia? Scottiana*, Choisy l. c. (not of Wall. Herb.).

In all the provinces except the Andamans and Nicobars, at low elevations, common. Distrib. Malay Archipelago.

2. *ADINANDRA ACUMINATA*, Korth. Verh. Nat. Gesch. Bot. 109. A tree 40 to 60 feet high; all parts except the stamens glabrous; young branches slender, smooth, dark-coloured; the older pale and rough. *Leaves* coriaceous, oblong-lanceolate, acuminate, the base acute, both surfaces shining; midrib prominent below; the 9 to 11 pairs of nerves rather prominent below when dry, forming a double series of arches inside the margin; length 3.5 to 6 in., breadth 1 to 2.5 in., petiole .25 in. *Flowers* .9 in. in diam.; peduncles .75 to 1 in. long, thickened and verrucose after flowering; bracteoles leathery, lanceolate, at some distance from the calyx, alternate. *Sepals* leathery, glabrous; the two outer small, ovate; the three inner much larger, spreading, rotund, the edges serrulate. *Petals* larger than the inner sepals, rotund, spreading, fleshy, the edges thin. *Stamens* about 40, the inner smaller: filaments united by their bases,

short, coarsely pilose as are the narrow elongate apiculate anthers. *Ovary* 5-celled, depressed, ribbed, pubescent; style filiform, pilose; stigma small, conical. *Fruit* .5 to .75 in. in diam., baccate, dry, with coriaceous, pubescent, but ultimately glabrous, pericarp, 2-celled, many seeded: *Seeds* oval, flat, furrowed on both sides. Hook. fil. Fl. Br. Ind. I, 282. Miq. Fl. Ind. Bat. I, Pt. 2, p. 478. *Gordonia acuminata*, Wall. Cat. 3664. *Ternstræmia?* *coriacea*, Wall. Cat. 1453. *Camellia axillaris*, Wall. Cat. 1453, p. 158 (not of Roxb. ex Bot. Reg. 349, see Journ. Linn. Soc. xiii, 330). *Polyspora axillaris*, Choix. Mem. Ternstr. 91 (not of Don).

In all the provinces, from 1000 feet to (in Perak) 4000 feet: common. Distrib. Sumatra.

In Journ. Linn. Soc. xiii, 330, there is a note by Mr. W. T. Thiselton Dyer (who elaborated this family of *Ternstræmiaceæ* in the Flora of Brit. India) on the plant issued by Wallich as *Ternstræmia coriacea*, and identified by him (in an appendix to his Catalogue,) with *Camellia axillaris*, Roxb. Mr. Dyer shows that, under the name *C. axillaris*, Roxb., a totally different plant (= *Gordonia anomala*, Spreng) was figured in the Bot. Register (t. 349), and that Wallich's *T. coriacea* was neither Roxburgh's plant nor that figured in the Bot. Register, but really *A. acuminata*, Korth.

3. *ADINANDRA MACULOSA*, T. Anders. Hook. fil. Fl. Br. Ind. I, 282. A tree 40 to 60 feet high; young branches dark-coloured, pubescent near the apex, not silky. *Leaves* coriaceous, elliptic to sub-rotund, shortly, bluntly and abruptly acuminate, entire, the base acute; upper surface smooth, shining; the lower pale brown, dull, opaque, minutely rugulose when dry; main nerves 8 to 10 pairs, spreading, very indistinct; midrib distinct: length 3.5 to 5.5 in., breadth 1.5 to 2.25 in.; petiole .25 to .4 in., glabrous. *Flowers* .75 in. in diam.; peduncles little longer than the petioles, pubescent; bracteoles sub-rotund, opposite, close to the calyx. *Sepals* unequal, the two inner smaller, rotund to broadly ovate, very fleshy, puberulous externally, the edges thin and glabrous as is the whole internal surface. *Petals* membranous, ovate, acute, glabrous, connivent. *Stamens* about 30; filaments attached to the petals, short, glabrous: *Anthers* narrow, the cells elongate, lateral; the connective sericeous with short glabrous apiculus. *Ovary* depressed-hemispheric, 5-ribbed, 5-celled. *Style* cylindric, glabrous: stigma small, conical. *Fruit* .5 in. in diam., globular, baccate, 4-celled, the leathery pericarp at first pubescent but finally glabrous; *seeds* numerous, black, shining, horse-shoe-shaped, small. *Ternstræmia integririma*, Wall. Cat. 1452 in part.

Penang; Wallich, Curtis. Perak; Seortechini, Wray, King's Collector: at elevations of from 1800 to 4000 feet.

4. *ADINANDRA INTEGERRIMA*, T. Anders. Hook. Fl. Br. Ind. I, 282. A small tree: young branches with dark-coloured bark, the extremities fulvous-pubescent, the leaf-buds sericeous. *Leaves* sub-coriaceous, ovate to ovate-oblong, shortly acuminate, the base acute or rounded, the margin minutely glandular-serrulate; upper surface glabrous, shining, greenish when dry; the lower pale brown, sparsely pubescent and with many minute black glands; main nerves 10 to 14 pairs, thin, interarching .2 in. from the margin, slightly prominent on both surfaces (when dry) as are the reticulations: length 3.5 to 5 in., breadth 1.4 to 2.25 in.; petiole .2 to .25 in., pubescent. *Flowers* .6 in. in diam.; peduncles not much longer than the petioles, strigose; bracteoles ovate, acute, opposite, close to the calyx. *Sepals* spreading, broadly ovate, acute; the two outer larger, very thick, the edges thin, serrulate-denticulate; externally adpressed-sericeous, internally smooth and shining. *Petals* smaller than the sepals, coherent by their bases, connivent, ovate, acute, membranous, glabrous except an adpressed sericeous patch on the back, connivent. *Stamens* about 30, adnate to the base of the petals; filaments short, glabrous; anthers elongate, fusiform, the cells lateral; connective sericeous with a long glabrous apiculus. *Ovary* depressed-hemispheric, adpressed-sericeous, 5-celled, multi-ovulate; style cylindric, expanded below, sericeous; stigma small, sub-capitate. *Fruit* (*vide* Dyer) baccate, adpressed-pubescent, .7 in. in diam. *Seeds* small, shining. Dyer in Hook. fil. Fl. Br. Ind. I, 282. Pierre Fl. Forest Coch.-Chine, t. 125, (excl. syn. *T. villosa*, Choisy.). *Ternstroemia dasyantha*, Choisy (not of Korth.). *Ternstroemia? integerrima*, Wall. Cat. 1452 (in part) and 2246. *Gordonia reticulata*, Wall. Cat. 3663 and 7070.

Penang; Wallich. Perak, Scortechini: at low elevations.

The specific name is unfortunate, as in all the specimens I have seen the leaves are as described above and not entire.

5. *ADINANDRA VILLOSA*, Choisy Mem. Ternstr. 24. A pubescent tree, 40 to 50 feet high: young branches pilose, pale brown, leaf buds sericeous. *Leaves* coriaceous, oblong-lanceolate, shortly acuminate, entire or faintly glandular-crenate; the base rounded, rarely acute; upper surface shining, glabrous except the pubescent midrib; under surface yellowish, sparsely pubescent: nerves 7 to 9 pairs, ascending, interarching within the margin, not prominent: midrib bold; reticulations rather distinct: length 4 to 5.5 in., breadth 1.5 to 1.75 in.; petiole .2 in., pilose. *Flowers* .75 in. in diam., from .4 to nearly 1 in. long, pilose; bracteoles ovate, from the middle of the peduncle, fugaceous. *Sepals* spreading, subequal, rotund, fleshy, pilose externally, smooth internally. *Petals* ovate, blunt, membranous, adpressed-sericeous externally, the edges glabrous. *Stamens* about 30, attached to the bases of the petals, sericeous, the

filaments short; cells narrow, elongate, connective with a glabrous apiculus. *Ovary* depressed-hemispheric, adpressed-sericeous, 5-ridged, 5-celled; *style* cylindric, glabrous except at the base; stigma minute. *Fruit* .5 in. in diam., baccate, adpressed-sericeous, 4-celled. *Seeds* numerous, reniform, brown, small. Hook. fil. Fl. Br. Ind. I, 283. Kurz Fl. Burm. i, 100. *Ternstroemia?* *sericea*, Wall. Cat. 1454. *Schima Wallichii*, Choisy Mem. Ternst, 91 (not of Choisy in Zoll. Cat.)

Perak; King's Collector, Wray, at elevations from 3000 to 4000 feet. Distrib. Tavoy.

6. *ADINANDRA HULLETTII*, King, n. sp. A tree; young branches densely and minutely rusty-tomentose. *Leaves* coriaceous, elliptic-oblong, shortly acuminate, the base acute; edges glandular, denticulate, slightly recurved when dry; upper surface smooth, shining; lower brown, densely and minutely tomentose, the midrib prominent; the nerves spreading, obscure, about 10 pairs; length 3.5 to 5.5 in., breadth 1.5 to 2.5 in., petiole .25 in. *Flowers* .75 in. in diam.; peduncles .4 to .5 in., tomentose; bracteoles broadly ovate, acute, opposite, close to the calyx. *Sepals* spreading, fleshy, all glabrous internally: the outer 2 rotund, tomentose externally, larger than the others; the inner 3 ovate-rotund, tomentose externally, the edges glabrous. *Petals* longer than the sepals, membranous, oblong, blunt, glabrous, the tips reflexed. *Stamens* from 40 to 50, all epipetalous; anthers densely pubescent, the connective with a long blunt glabrous apiculus; filaments short, geniculate. *Ovary* conic-hemispheric, adpressed-sericeous; style glabrous; stigma small, conic. *Fruit* unknown.

Singapore; Murton, No. 144, Hullett, No. 103. Penang; Curtis, No. 275, in part.

A very distinct species of which fruit is as yet unknown.

7. *ADINANDRA MACRANTHA*, Teysm. and Binn. Nat. Tijd. Ned. Ind. xxv, 421. A tree 20 to 50 feet high: young branches with pale glabrous bark, the apices and buds sericeous. *Leaves* coriaceous, elliptic-oblong, with a broad apex suddenly contracted to a short blunt acumen, narrowed in the lower third to the sub-acute base; the edges entire or faintly crenate; both surfaces glabrous; the upper greenish, the lower pale yellowish when dry: midrib bold, sometimes puberulous; main nerves 15 to 20 pairs forming a double series of arches inside the margin, rather prominent as are the reticulations; length 5 to 7 in., breadth 2 to 3.25 in.; petiole .25 in., stout. *Flowers* 1.4 in. in diam.; peduncles 1 to 1.5 in. long, smooth: bracteoles rotund-reniform, opposite, close to the calyx. *Sepals* spreading, fleshy with thin ciliolate edges, smooth, rotund, the two outer smaller. *Petals* larger than the sepals, sub-coriaceous with thin edges, rotund, spreading. *Stamens* 40 to 50, adpressed-

sericeous everywhere, the apiculus of the connective with a terminal tuft; filaments short. *Ovary* depressed-hemispheric, 3-4-celled, smooth as is the cylindric style; stigma small, conical. *Fruit* .75 in. in diam., imperfectly 3 to 4-celled, pericarp smooth. *Seeds* few, large, brown, horse-shoe-shaped, punctate, shining.

Perak; from 500 to 1500 feet, King's Collector, Scortechini. Distrib. Sumatra.

The Perak specimens agree perfectly with Teysmann's types collected in Sumatra.

8. *ADINANDRA MIQUELII*, King. A medium sized tree: young branches stout, the bark white and polished. *Leaves* thickly coriaceous, oblanceolate, apex with a short blunt abrupt point, gradually narrowed in the lower half to the petiole, entire; midrib prominent; nerves 5 to 7 pairs, ascending, anastomosing .2 in. from the margin, invisible in the fresh, inconspicuous in the dry state; length 4 to 6 in., breadth 1.5 to 2.25 in.; petiole .6 to .75 in., stout. *Flowers* about .75 in. in diam., scattered below the apices of the branches, axillary and extra-axillary, polygamous: peduncles spreading, solitary, compressed, pale, .75 to 1 in. long; the bracteoles just below the flower, small, fugaceous. *Sepals* fleshy, rotund, the 2 outer much smaller. *Petals* larger than the sepals, rotund, clawed, fleshy. *Stamens* numerous, chiefly from the torus, pubescent, the connective with a long apiculus, filaments short. *Ovary* depressed-globose, 2-celled, narrowed above into the short cylindric style: stigma shortly bifid, the lobes narrow acute spreading. *Fruit* unknown. *Ternstroemia bancana*, Miq. Fl. Ind. Bat. Suppl. 477.

Penang; Curtis, No. 1612. Distrib. Bangka.

The stigma shows that this does not belong to the genus *Ternstroemia* into which Miquel put it. It is evidently a rare plant in Penang, as Curtis's specimen (which agrees perfectly with Miquel's type-specimens from Bangka) is the only one which I have seen from that island.

3. *TERNSTROEMIA*, Linn.

Evergreen glabrous trees or shrubs. *Leaves* more or less coriaceous, entire or crenate-serrate. *Peduncles* axillary, solitary or sub-fasciculate, recurved, 2-bracteolate, flowers usually dioecious. *Sepals* 5, imbricate. *Petals* 5, imbricate, connate by their bases. *Stamens* many, mostly adherent to the base of the corolla, anthers glabrous. *Ovary* 2 to 3-celled, style simple or absent. *Stigma* broadly 2 to 3-lobed or sub-entire; ovules usually 2 in each cell, pendulous. *Fruit* indehiscent, sub-baccate. *Seeds* rather large, the albumen copious or scanty. Distrib. Tropical Asia and America; species about 30.

1. *TERNSTROMIA PENANGIANA*, Choisy Mem. Ternst. 20. A tree 40 to 60 feet high: young branches rough, stout, pale brown. *Leaves* coriaceous, oblanceolate to obovate, sub-acute or bluntly mucronate, rarely blunt or emarginate, entire, the base narrowed to the petiole; nerves 5 to 7 pairs, spreading, invisible when fresh and inconspicuous when dry, the midrib prominent: length 3·5 to 6 in., breadth 1·5 to 2·5 and (in Wallich's specimen) to 4 in., petiole ·6 to ·75 in. *Flowers* ·8 to 1·25 in. in diam., dioecious, solitary, axillary; pedicels ·75 in. long, recurved or straight. *Sepals* rotund, fleshy with thin edges. *Petals* much larger than the sepals but similar in texture, rotund with a broad claw, the edges sub-denticulate. *Stamens* in the male very numerous, crowded, short, (reduced to filaments in the female); connective slightly produced beyond the anther cells, truncate; ovary globular, its cells biovulate. *Stigmas* 2, large, reniform, with erose glandular edges. Berry dry with coriaceous epicarp, globular, 1 to 1·5 in. in diam., subtended by the thickened rugulose connate sepals: *Seeds* about 4, oblong. Dyer in Hook. fil. Fl. Br. Ind. I, 281. Kurz For. Fl. Burmah i, 99. Miq. Fl. Ind. Bat. I, Pt. 2, p. 469. Pierre Fl. For. Coch.-Chine, t. 123. *T. macrocarpa*, Scheff. Obs. Phyt. i, p. 5. *Erythrochiton Wallichianum*, Griff. Notul. iv. 565, t. 585 A, fig. 7. *Fagraea dubia*, Wall. Cat. 4456. *Garcinia acuminata*, Wall. Cat. 4871 A, in part, (*vide* Hooker in Journ. Linn. Soc. xiv, 486.

Penang; Wallich, Griffith, Curtis. Andamans and Nicobars; Kurz, King's Collector. Distrib. Java.

This species was founded by Choisy on the imperfect Wallichian specimens from Penang issued by Wallich as his No. 4456. These specimens consist of leaves and fruit with some imperfect flowers. The leaves are obovate, almost rotund, and broader than those of any *Ternstroemia* which has been collected since. It is therefore not quite certain that the Andaman and Nicobar plant is really the same as Wallich's, although in stigma and fruit it agrees. The plant described and figured as *T. Penangiana* by Pierre (l. c.) is obviously the same as the Andaman and Nicobar species, but whether it is the same as Wallich's No. 4456, I am not prepared to say.

2. *TERNSTROMIA SCORTECHINII*, King, n. sp. A tree, 20 to 40 feet high: young branches with pale brownish-grey bark, striate when dry. *Leaves* coriaceous, verticillate, drying of a pale green, oblanceolate, the apex shortly abruptly and rather bluntly acuminate, narrowed from above the middle to the rather stout short petiole; edges entire; under surface rather pale; midrib distinct on both surfaces; nerves visible on neither; length 3 to 5 in., breadth 1·25 to nearly 2 in.; petiole ·4 to ·5. *Flowers* dioecious, ·6 to ·7 in. in diam., pedunculate, axillary, solitary or in fascicles of 2 to 6; peduncles slender, compressed, 1 to 1·5 in. long; the 2

bracteoles about .2 in. below the calyx, minute, fugacious. *Sepals* subequal, fleshy with thin edges, rotund. *Petals* much larger than the sepals, orbicular to reniform, elawed. *Stamens* in the male very numerous; anthers sub-sessile, the connective broad, bearing the 2 cells on its edges and produced above them into a broad short truncate process; rudimentary ovary flattish, without stigma. *Female flowers* like the males but with fewer stamens; *ovary* hemispheric, imperfectly 2-celled; stigmas 2, sub-sessile, flat, foliaceous; each divided into 3 or 4 lobes with thick corrugated edges. *Fruit* a dry ovoid berry with coriaceous dark-coloured epicarp, .75 in. long, and .2 in. in diam., subtended by the leathery calyx. *Seeds* 2, large, broad, horse-shoe-shaped, flattish, .5 in. long.

Perak, at low elevations; Seorteehini, King's Collector.

A very distinct species with leaves curiously like those of *Illicium evenium*, and with smaller flowers than the other species.

3. *TERNSTRÆMIA CORIACEA*, Seheff. Obs. Phyt, ii, p. 16, (not of Wall.).

A tree 50 to 70 feet high: young branches light brown, smooth. *Leaves* coriaceous, usually oblong-oblanccolate with an abrupt short blunt apiculus, sometimes oblong-lanceolate and acute; attenuate in the lower third to the stout petiole: midrib bold; main nerves 5 to 9 pairs, spreading, anastomosing .2 in. from the entire margin, rather inconspicuous even when dry: length 4 to 6 in., breadth 1.75 to 2.5 in., petiole .75 to 1 in. *Flowers* 1.25 to 1.5 in. in diam., dioceious, solitary, axillary or from the axils of fallen leaves; peduncles flattened, deep brown, 1.5 to 2 in. long, slender; bracteoles alternate, minute, about .25 in. below the calyx. *Sepals* fleshy with thin edges, rotund; the 2 outer rather smaller than the inner 3. *Petals* larger than the sepals, much imbricate, rotund, fleshy, not elawed. *Stamens* in the male numerous, from the torus, the connective with a broad rounded apical appendage; quite absent in the female flower. Ovary globular, 2-celled; *stigmas* 2, sub-sessile, each deeply divided into 6 to 8 sub-spathulate lobes. *Fruit* baccate, globular-ovoid, .75 in. in diam. and nearly 1 in. long, dry, with a coriaceous rind, subtended by the slightly enlarged hardened calyx and crowned by the remains of the stigma. *Seeds* about 4, oblong, the testa rugulose.

Malacca; Griffith (Kew Distrib.) 183. Penang; Curtis, No. 1055. Perak; King's Collector. Distrib. Bangka.

Distinguished from the preceding by its anthers, by the venation of its leaves, and by its young branches. Teysmann's specimens from Bangka in no way differ from those from Perak, Malacca and Penang. Wallich's fragmentary specimens, (Cat. No. 7430,) probably fall here. The plant issued by Wallich as *Ternstræmia coriacea* (Cat. No. 1453) is, as

suggested by the late Dr. Anderson and Mr. Dyer (Journ. Linn. Soc. xiii, 331), *Adinandra acuminata*, Korth.

4. EURYA, Thunb.

Shrubs. *Leaves* narrow, usually crenate-serrate. *Flowers* small, unisexual, sessile or shortly pedicelled, in axillary fascicles, rarely solitary, with persistent bracteoles. *Sepals* 5. *Petals* 5, united at the base. *Stamens* 15 or less, rarely 5; anthers glabrous. *Ovary* 3 (rarely 2-5)-celled; styles 3 (rarely 2-5) free or united; ovules many in the inner angle of each cell. *Fruit* baccate. *Albumen* fleshy. Distrib. S. E. Asia, Indian Archipelago and Pacific Islands; described species more than 30, probably reducible to 10.

1. EURYA ACUMINATA, DC. Mém. Ternst. 29. A tree 30 to 40 feet high: young branches slender, pubescent to minutely tomentose. *Leaves* thinly coriaceous, narrowly oblong-lanceolate or oblanceolate, acuminate, serrulate, the base acute; upper surface glabrous, shining; the lower paler, pubescent especially on the midrib, or sub-glabrous; length 2·5 to 3·5 in., breadth ·5 to ·75 in., petiole ·1 in. or none. *Flowers* 25 in. in diam., in 2 to 6-flowered clusters; pedicels short, pubescent, bracteolate. Buds globose. *Sepals* unequal, the outer smaller, rotund with a thickened wrinkled patch near the base, pubescent externally. *Petals* larger and thinner than the sepals, oblong, blunt, veined, glabrous. *Male flowers*: stamens about 12, glabrous; filaments slender, anthers oblong, blunt; rudimentary ovary conic without styles, or absent. *Female flower* as in the male, but the sepals and petals smaller and narrower; stamens 0; ovary ovoid-conic; smooth, 3 or (by abortion) 2-celled, multi-ovulate; styles 3, united or free in the lower two-thirds, cylindric, about as long as the ovary. *Stigmas* on the inner surfaces of the upper part of the styles. *Fruit* globular, 1·5 in. in diam., smooth, subtended by the persistent calyx and crowned by the styles. *Seeds* small, angled, pitted, shining, brown. *Diospyros serrata*, Ham. in Don Prod. Fl. Nep. 143.

In all the provinces at low elevations, common. Distrib. Sub-tropical Himalaya, Assam, Chittagong and Burmese Ranges, Malay Archipelago, Fiji Islands.

In a plant with such a wide distribution, variations in form are only to be expected. Many of these have been treated as species which, in Sir J. D. Hooker's *Flora of British India*, Mr. Thiselton Dyer has reduced to varieties as follows:

Var. 1. *euprista*, Korths. Verh. Nat. Gesch. Bot. 113 (sp.); styles distinct. Griff. Ic. 604, f. 3. *E. multiflora*, DC. l. c. 25. *E. serrata*, Blume Fl. Jav. præf. vii. *E. angustifolia*, Wall. Cat. 1465.

E. acuminata, Royle Ill. 127, t. 25. *E. salicifolia*, Blume Mus. Bot. II, 118. *E. chinensis*, Hook. f. and Thoms. Herb. Ind. Or. (not of Brown).

Var. 2. *Wallichiana*, Steud. in Blume Mus. Bot. ii, 118 (sp.); styles united. *E. lucida*, Wall. Cat. 1462. *E. fasciculata*, Ham. in Wall. Cat. 1463. *E. acuminata*, Wall. Cat. 1464. *E. bifaria*, Wall. Cat. 3721 ? *E. membranacea*, Gardn. in. Cale. Journ. Nat. Hist. vii, 444. *E. japonica*, β *acuminata*, Thw. Enum. Pl. Cey. 41.

2. *EURYA WRAYI*, King, n. sp. A small tree: young branches slender, purplish-brown, laxly pubescent towards the apex. *Leaves* drying greenish-yellow, thinly coriaceous, oblong-lanceolate, bluntly acuminate, minutely serrulate, the base rounded: upper surface glabrous, shining; lower paler, dull, sparsely pubescent; length 2 to 2.75 in., breadth .5 to .7 in., petiole .1 in. *Flowers* narrowly ovate, pointed, scarcely expanding, .1 in. in diam. and .2 in. long, axillary, solitary or in 2 to 6-flowered sessile umbels, quite glabrous: pedicels slender, glabrous, 1' to .15 in. long, bi-bracteolate. *Sepals* unequal, erect, fleshy, ovate, acute, much imbricate. *Petals* sub-equal, erect, membranous, ovate, acute, connate in the lower third. *Stamens* 15, glabrous; anthers narrow, elongate, shortly apiculate; filaments short. *Ovary* ovoid, gradually narrowing into the thick style, imperfectly 3-celled; stigmas short. *Fruit* unknown.

Perak; at Tapa, Wray.

Distinguished by its narrowly ovate pointed flower-buds and flowers, and by the rounded bases of its leaves.

4. *ACTINIDIA*, Lindl.

Glabrous, strigose, or tomentose shrubs; usually climbers. *Leaves* entire or serrate, usually membranous, feather-veined. *Flowers* polygamous or dioecious, in axillary cymes, rarely solitary. *Sepals* 5, slightly imbricate, subconnate at the base. *Petals* 5, somewhat contorted-imbricate. *Stamens* many; anthers dehiscing by slits. *Ovary* many-celled; the styles as numerous, divergent and elongated after flowering. *Fruit* baccate. Distrib. Himalaya, China and Japan; species about 8.

1. *ACTINIDIA MIQUELII*, King, n. sp. Slender, scandent, 30 to 60 feet long: young branches cylindric, striate, glabrous, dark-coloured. *Leaves* membranous, ovate-acuminate to sub-rotund, mucronate, minutely glandular-dentate, the base rounded or slightly cordate; upper surface glabrous, rigid, the nerves and midrib minutely pubescent: lower surface pale brown when dry, minutely but densely tomentose; nerves about 5 pairs, the lower spreading, the upper sub-erect, prominent beneath as are the midrib and transverse veins; length 3 to 4 in., breadth

2.5 to 3.5 in.; petiole 1.25 to 1.5 in., slender. *Cymes* axillary, dichotomous, spreading, rusty-tomentose, on slender ebracteate peduncles 1.5 in. long which lengthen to 3 in. in fruit. *Flowers* numerous, dioecious, .5 in. in diam.; pedicels .3 to .4 in. long. *Sepals* thick, ovate, blunt, densely rusty-tomentose externally. *Petals* larger than the sepals, membranous, oblong-obovate, blunt. *Stamens* in males very numerous, glabrous; the anthers broadly oblong, blunt, deeply cordate at the base; filaments slender. *Ovary* in the males absent or rudimentary, densely pilose, and with several rudimentary styles. *Female flowers* unknown. *Fruit* ovoid, .75 in. long, and .4 in. in diam., baccate, smooth, pulpy, subtended by the persistent calyx and crowned by the remains of 15 to 20 filiform styles. *Seeds* numerous, shining, brown, less than .1 in. long, ovoid, sub-compressed, pitted and with several longitudinal grooves. *Kadsura pubescens*, Miq. Fl. Ind. Bat. Suppl. 620.

Perak; on trees, at elevations of 3,500 to 4000 feet, King's Collector, Nos. 5437 and 8789. Distrib. Eastern Sumatra.

I have carefully examined a type specimen of Miquel's *Kadsura pubescens* from Sumatra named by the author's own hand; and there is no doubt whatever that it is an *Actinidia* and not a *Kadsura*; nor is there any that it is identical with the above quoted numbers of the Calcutta collector from Perak. Miquel is quite wrong in describing his plant as having 3 sepals and 6 petals; there being 5 in each whorl.

6. SAURAUJA, Willd.

Trees or shrubs. *Branches* usually brown with whitish tubercular dots, both branches and leaves more or less strigose-pilose or scaly when young. *Leaves* approximate at the ends of the branches, usually serrate, with parallel veins diverging from the midrib. *Inflorescence* lateral, often from the axils of fallen leaves, eymose, subpaniculate, rarely few-flowered. *Bracts* usually small, remote from the calyx. *Flowers* usually hermaphrodite. *Sepals* 5, strongly imbricate. *Petals* 5, usually connate at the base. *Stamens* many; anthers dehiscent by pores. *Ovary* 3-5-celled; styles as many, distinct or connate, rarely dry and sub-dehiscent. Distrib. Tropical and sub-tropical Asia and America. Species about 60.

1. SAURAUJA TRISTYLA, DC. Mém. Ternstr. 31, t. 7. A shrub or tree 2 to 3 feet high; young branches with grey, faintly striate bark, deciduously scurfy and strigose towards the apices. *Leaves* membranous, oblanceolate, abruptly and shortly acuminate, minutely and remotely serrulate or sub-entire, the base acute; both surfaces glabrous, except the midrib and main nerves which have a few scale-like hairs, the lower pale brown when dry; nerves 10 to 12 pairs, erecto-patent, rather prominent be-

neath; length 5 to 8 in., breadth 1·5 to 3 in., petiole ·5 to 1 in. *Flowers* ·2 to ·3 in. in diam., narrowly ovate in bud, in fascicles of 2 to 5 from small axillary tubercles, but mostly from the axils of fallen leaves; the pedicels slender, minutely bracteolate, ·75 in. long, scurfy. *Male flower*; *sepals* erect, unequal, the two outer smaller, more or less broadly ovate, blunt; *petals* larger than the sepals, sub-erect, membranous, veined, oblong, blunt: stamens about 25, glabrous; the anthers broadly ovate, blunt, with sutural dehiscence; rudimentary ovary none. *Female flower*; *sepals* and *petals* as in the male; stamens absent. *Ovary* ovoid, glabrous; *styles* 3, distinct to the base, or united half way. *Fruit* globular, sub-dehiscent, scarcely exceeding the calyx. *Seeds* broadly ovate, angled, deeply pitted. Dyer in Hook. fil. Fl. Br. Ind. i, 287. Miq. Fl. Ind. Bat. i, Pt. 2, p. 483; Kurz For. Fl. Burm. i, 104. *Scapha Candollei* and *S. Pinangiana*, Choisy Mem. Ternst. 31. *Ternstræmia pentapetala*, Jack in Malay. Misc. i, No. 5, 40. *T. trilocularis*, Roxb. ex Wall. Pl. As. Rar. ii, 40. *T. bilocularis*, Boxb. Fl. Ind. ii, 522?

In all the provinces (except the Andamans and Nicobars from which it has not as yet been sent); at low elevations, common.

The plant figured under this name by Pierre (Fl. Forest Coch.-Chine) is obviously a different species; for it has 5 styles, and it differs also in other respects.

2. SAURAUJA NUDIFLORA, DC. Mém. Soc. Geneve, i, 422. A tree 20 to 30 feet high; youngest branchlets dark-coloured, squamulose towards the apex; the older esquamulose, pale, faintly striate. *Leaves* membranous, oblanceolate, shortly and sharply acuminate, minutely glandular-serrate, narrowed in the lower half to the acute base; both surfaces glabrous; the midrib and 12 to 13 pairs of bold spreading nerves puberulous on the upper, sparsely covered with flattened hairs on the lower, surface; length 6 to 10 in., breadth 2·25 to 3·75 in., petiole ·5 to 1·25 in. *Flowers* ·25 to ·4 in. in diam., white, glabrous, solitary or in 2 to 3-flowered fascicles from tubercles in the axils of leaves or of fallen leaves; pedicels ·5 to 1 in. long, slender, sparsely scurfy, and with several acute bracteoles. *Sepals* rotund, fleshy with thin edges, united at the base. *Petals* oblong-obovate, emarginate, united below, larger than the sepals. *Stamens* 25 to 30, attached to the base of the corolla: anthers oblong-ovate, curved, the dehiscence sutural, not apiculate; filaments short. *Ovary* hemispheric, pubescent. *Styles* 3 to 5, united in the lower half. *Fruit* covered by the accrescent calyx. *Seeds* ovate, deeply foveolate, pale brown, shining. Miq. Fl. Ind. Bat. I, Pt. ii, p. 484. ? *S. Noronhiana*, Bl. Bijdr. 126.

Perak 800 to 3,500 feet, common. Distrib. Sumatra and Java.

This differs from *S. tristyla* in its rotund sepals, larger flowers, pu-

bescent ovary, sub-globular seeds, and in its often having 5 styles. There may be two species covered by the foregoing description: but I cannot find a constant character to separate them. I believe this to be Blume's *S. Noronhiana* and De Candolle's *S. nudiflora*: but, not having been able to consult any authentic specimen of the former and only moderately good ones of the latter, I am not quite satisfied of the identity with them of this common Perak tree. The genus *Saurauja* is a very puzzling one. The species come very close together, and Miquel's descriptions of the numerous species which he named are so incomplete that it is almost impossible to recognise them with any certainty.

3. SAURAUJA CAULIFLORA, Bl. Bijdr. 128, var. *calycina*, King. A tree: young branches and petioles densely covered with long paleaceous yellowish hairs. *Leaves* elliptic-oblong, shortly and sharply acuminate, the edges faintly aristate-serrate, the base acute; upper surface glabrous; lower pale brown when dry, strigose on the midrib nerves and veins; main nerves 12 to 14 pairs, spreading, prominent beneath; length 6 to 9 in., breadth 2·25 to 2·75 in., petiole about 1 in. *Flowers* 4 in. in diam., on long pedicels, crowded in large fascicles from flat tubercles on the larger branches and stem; pedicels from 1·75 to 1·5 in. long, tomentose-squamulose, rufous. *Sepals* rotund, the outer densely tomentose-squamulose; the inner almost glabrous, veined. *Petals* obovate-oblong, blunt, united in their lower third, membranous, nerved, scarcely so large as the sepals. *Stamens* about 25, adherent to the corolla, elongate-ovate, adnate, dehiscing by two large apical pores. *Ovary* scaly, 3-celled, multi-ovulate. *Styles* 3, united by their bases only. *Fruit* enveloped by the slightly accrescent calyx, sub-glabrous, 3-celled. *Seeds* small, ovate-rotund, compressed, foveolate, pale brown. DC. Mém. Soc. Geneve I, 425; Korth. Verh. Nat. Gesch. Bot. 126; Hassk. Pl. Jav. Rar. 273; Miq. Fl. Ind. Bat. I, Pt. ii, p. 486. Ann. Mus. Ludg. Bat. IV, 106.

Perak: Batu Kurau. Scortechini, No. 1614.

This differs in no respect from the plant described by Blume, of which I have seen good specimens, except in its larger sepals which are densely tomentose-squamulose externally.

7. PYRENARIA, Blume.

Shrubs or trees. *Leaves* serrate, large and sub-membranous. *Flowers* sub-sessile, axillary, erect or nodding. *Sepals* usually 5, unequal, graduating from the bracts to the petals. *Petals* connate at the base. *Stamens* very numerous, mostly connate, adnate to the base of the petals. *Ovary* 5-celled; styles 5, free, or partially united; ovules 2 in each cell, attached laterally. *Fruit* drupaceous, indehiscent. *Seeds* oblong, stout, with a thick woody testa, wingless; albumen 0; cotyledons large, crum-

pled or conduplicate; radicle inferior, inflexed. Distrib. Malay Peninsula and Indian Archipelago. Species about 7.

1. *PYRENARIA ACUMINATA*, Planch. ex Choisy Mém. Ternstr. 84. A shrubby tree, 15 to 30 feet high: young branches densely tawny or fulvous-tomentose. *Leaves* elongate-ob lanceolate, sometimes oblong-elliptic, acuminate, minutely serrulate, the base attenuate; upper surface glabrous, shining, the midrib and nerves puberulous, greenish when dry; the lower softly pubescent, minutely papillose; the midrib stout, tomentose; main nerves about 10 pairs, sometimes forking and always interarching about .25 in. from the margin; length 6 to 12 in., breadth 2 to 3.5 in.; petiole .4 in., tomentose. *Flowers* 1.5 in. in diam., shortly pedicellate, solitary, crowded towards the ends of the branches in the axils of leaves or of abortive leaves; pedicels recurved, tomentose; bracteoles lanceolate, close to the calyx, tawny-silky externally as are sepals and petals. *Sepals* and *petals* graduated in size from the bracts inwards, broadly ovate, acuminate, glabrous and brownish internally; *anthers* ovate, adnate, only about one-fourth the length of the slender filaments. *Ovary* ovoid, sericeous: styles united in the lower half, free above: stigmas small. *Fruit* depressed-globose, 1.5 in. in diam., and 1 in. long; the pericarp sericeous, becoming glabrescent, leathery, sub-succulent. *Seeds* few, large, sub-reniform, compressed. Miq. Fl. Ind. Bat. I, Pt. ii, p. 493; Dyer in Hook. fil. Fl. Br. Ind. i, 290. *Ternstroemia* ? *macrophylla*, Wall. Cat. 3663. *Gordonia* (*Camellia* ?) *acuminata*, Wall. Cat. 3664.

Singapore, Malacca, Penang and Perak; at low elevations.

2. *PYRENARIA KUNSTLERI*, King, n. sp. A tree 15 to 30 feet high; all parts glabrous except the very apices of the branches, the youngest leaf-buds, and the flowers. *Leaves* elliptic-oblong to oblong-ob lanceolate, acuminate, faintly serrate in the upper three-fourths; the base entire, acute; both surfaces, but especially the lower, much pustulate when dry; the lower brown, the upper greenish; midrib and 6 to 8 pairs of erectopotent main nerves rather prominent below, the latter interarching .3 to .4 in. from the edge; secondary nerves prominent; length 5.5 to 7 in., breadth 1.8 to 2.5 in., petiole .3 to .4 in. *Flowers* .75 in. in diam., on peduncles .1 in. long; bracteoles 2, opposite, broad, close to the calyx. *Sepals* rotund, coriaceous, pubescent externally. *Petals* larger than the sepals, rotund, glabrous, fleshy with thin edges, white. *Stamens* numerous: anthers broadly ovate, apiculate, 4 or 5 times as long as the slightly flattened filaments. *Ovary* ovoid-conic, ridged, adpressed-pubescent, 5-celled. *Style* short, conic, glabrous, 5-ridged. *Stigmas* small, acute, connivent. *Fruit* 1.25 in. long, and .9 in. in diam., ovoid, bluntly 5-ridged, pubescent. *Seeds* few, ovate, sub-compressed, .6 in. long.

Perak; at elevations of 500 to 2000 feet. King's Collector.

3. *PYRENARIA WRAYI*, King, n. sp. A bush; the young branches pale, minutely adpressed-pubescent towards the apices as are the leaf-buds. *Leaves* thinly coriaceous, oblong-ob lanceolate, shortly acuminate, obscurely crenate-serrate to sub-entire; the base attenuate, entire; both surfaces glabrous, the lower yellowish-green, pustulate when dry, the upper greenish: midrib prominent especially beneath: main nerves 10 to 12 pairs, interarching .25 in. from the margin, rather prominent beneath; length 6 to 8 in., breadth 1.75 to 2.25 in.; petiole .3 or .4 in., stout. *Flowers* .5 in. in diam., buds globose; peduncle very short, glabrous; bracteoles 3, broadly ovate, connate just below the calyx. *Sepals* 6, increasing in size inwards, rotund, minutely pubescent externally. *Petals* 6, rotund, concave, thinner than the sepals, puberulous externally with broad glabrous edges. *Stamens* numerous; anthers broadly ovate, about one-fourth as long as the filaments. *Ovary* shortly ovate-conic, with many lines of white hair, 5 or 6-celled. *Styles* 3, united for half their length: stigmas vertically flattened. *Ovules* 2 in each cell. *Fruit* sub-globular, bluntly 5-ridged, deciduously pubescent, 1 in. in diam. *Seeds* ovoid, sub-compressed, smooth, .6 in. long, the hilum very large.

Perak; at low elevations, Wray, Scortechini.

Closely allied to *P. Kunstleri*; but the leaves have many more nerves, the flowers are 6-merous with only 3 styles, and the fruit is more globular than in that species.

8. *SCHIMA*, Reinw.

Trees with evergreen leaves. *Peduncles* usually erect, axillary or solitary, or the uppermost shortly racemed. *Flowers* handsome, 2-bracteolate. *Sepals* 5, subequal, united below. *Petals* 5, much larger, connate at the base, the outermost concave and sub-cucullate. *Stamens* many, adnate to the base of the petals. *Ovary* 5- (rarely 4-6) celled; styles united, or partially free at the apex with broad spreading stigmas; ovules 2-6 in each cell, attached laterally, sub-pendulous. *Capsule* woody, depressed-globose, loculicidal, with a persistent axis. *Seeds* flat, kidney-shaped, dorsally ridged, hilum central, albumen scanty; cotyledons foliaceous, flat or crumpled, accumbent; radicle inferior, curved upwards. *Distrib.* Tropical Asia. *Species* about 3.

1. *SCHIMA NORONHAE*, Reinw. in Bl. Bijdr. 130. A tree 40 to 80 feet high: young branches with pale brown bark, deciduously pubescent, lenticellate. *Leaves* sub-coriaceous, narrowly elliptic to elliptic-lanceolate, acuminate, faintly crenate-serrate, often sub-entire, the base narrowed or rounded; both surfaces glabrous, the lower pale, dull: main nerves 9 or 10 pairs, spreading, slender, rather distinct below when dry, the minor nerves obsolete; length 4.5 to 6 in., breadth 1.4 to 2.5 in., petiole

·75 to 1·25 in., flat, more or less winged. *Flowers* 1·25 to 1·5 in. in diam., axillary, crowded at the apices of the branches and forming lax terminal pseudo-corymbs; peduncles 1 to 1·5 in. long, slender, thickened towards the apex, glabrous or pubescent, bracteoles minute. *Sepals* rounded, or sub-acute, glabrous or glabrescent, the margins minutely ciliate, about ·15 in. long. *Petals* thin, veined, obovate, clawed, their bases pubescent and their edges ciliate in the lower half, white or pale pink. *Stamens* 5-delphous; anthers sub-rotund, small, the filaments 4 or 5 times as long. *Ovary* depressed-hemispheric, pubescent, 5-celled. *Style* thick; stigma discoid, with 5 blunt lobes. *Fruit* ·75 in. in diam., adpressed-pubescent when young, glabrous or sub-glabrous when old; upper part of columella expanded, 5-angled. Korth. Verh. Nat. Gesch. Bot. 143, t. 29, figs. 21 to 27. Choisy Mém. Ternst. 54; Miq. Fl. Ind. Bat. I, Pt. i, p. 492; Ann. Mus. Lugd. Bat. IV, 112; Kurz For. Fl. Burm. i, 107. *S. crenata*, Korth. l. c. t. 29, figs. 1 to 20; Miq. Flora l. c. 491; Ann. l. c. 113; Kurz l. c. 107; Hook. fil. Fl. Br. Ind. i, 289. Pierre Fl. Forest Coch.-Chine, t. 121. *Gordonia floribunda*, Wall. Cat. 1456; Griff. Not. iv, 563. *G. oblata*, Roxb. Fl. Ind. ii, 572.

In all the provinces except the Andamans and Nicobars. Distrib. The Malayan Archipelago, Burmah, at elevations of 1000 to 3000 feet.

This rather widely distributed species varies remarkably little. In spite, however, of this, Korthal, carved out of it his species *S. crenata*, which he states to have the same calyx, corolla, stamens, ovary, style and stigma as Reinwardt's *Noronhae*, but to differ in the leaves and capsule. His own descriptions and figures of leaves and capsule, however, of both species are practically identical. The only other really distinct species of the genus appear to me to be *S. Khasiana*, Dyer, *S. bancana*, Miq. and perhaps *S. Wallichii*, Choisy.

9. GORDONIA, Ellis.

Trees with evergreen entire or crenate leaves. *Flowers* usually large, often subsessile, solitary in the axils of the leaves or collected at the ends of the branches, 2-4 bracteolate. *Sepals* usually 5, unequal, graduating from the bracts to the petals. *Petals* free or united at the base, imbricate, the inner larger. *Stamens* indefinite, 5-delphous or 1-delphous, adnate to the petals: anthers versatile. *Ovary* 3-5-celled; style single; the stigma flat, rotund, rather thick, sometimes lobed; ovules pendulous, 4 to 8 in each cell. *Capsule* oblong, woody, loculicidal, with a persistent column. *Seeds* flat or compressed, the apex often winged, albumen none; embryo usually straight, the cotyledons ovate, flat or plicate. Distrib. Tropical, Asia N. America. Species about 15.

1. *GORDONIA EXCELSA*, Bl. Bijdr. 130. A tree 30 to 40 feet high: young branches slender, smooth, pale brown, pubescent towards the apex. *Leaves* thinly coriaceous, glabrous, elliptic-lanceolate, acuminate, the edge slightly recurved, sub-serrulate, base acute; midrib bold, puberulous near the base beneath: main nerves 5 to 7 pairs, indistinct, bifurcating .3 in. from the edge and forming wide intra-marginal areolae: length 2.5 to 5 in., breadth 1 to 1.5 in.; petiole .3 in., slender. *Flowers* 1.5 in. in diam., subsessile, solitary, in the upper axils only; pedicel about .1 in.; bracteoles lanceolate, small, fugaceous. *Sepals* spreading, free, orbicular, pubescent externally, fleshy. *Petals* white, much larger than the sepals, orbicular, minutely pubescent externally, fleshy with broad membranous glabrous margins. *Anthers* ovoid, only a quarter of the length of the flattened filaments. *Ovary* hemispheric-conic, vertically ridged, densely sericeous, 5-celled. *Styles* single, slender, 5-angled; stigma small, with 5 blunt radiating lobes. Capsule 1.5 in. long, .75 in. in diam., deciduously adpressed-pubescent. *Seeds* 1 in. or more long, three-fourths being wing. Dyer in Hook. fil. Fl. Br. Ind. i, 291. Miq. Fl. Ind. Bat. I, Pt. ii, p. 489. *G. singaporiana*, Wall. Cat. 1457 (in part). *Antheeschima excelsa*, Korth. Verh. Nat. Gesch. Bot. 138, t. 27. *Dipterospermæ*, sp. Griff. Notul. iv, 564.

Malacca. Penang; Curtis No. 834, King's Collector. Perak; King's Collector, Wray; at elevations of 1200 to 2,500 feet. Distrib. Outer ranges of Eastern Himalaya.

Allied to *G. Maingayi*, but with much larger flowers and fruit and differently shaped leaves.

2. *GORDONIA GRANDIS*, King, n. sp. A tree 80 to 120 feet high; all parts except the flowers glabrous; young branches as thick as a goose-quill, dark purplish-brown when dry. *Leaves* coriaceous, oblong-oblancoate, shortly acuminate, faintly serrate-crenate in the upper two-thirds, entire in the lower third and prolonged along the petiole: upper surface greenish when dry, shining; the lower dull, brown: nerves 10 to 12 pairs, indistinct, interarching .15 in. from the margin; length 4.5 to 6 in., breadth 1.1 to 1.5 in., petiole proper .15 in. *Flowers* 1.5 to 2 in. in diam., solitary, axillary, about .3 in. long, puberulous; buds globose; bracteoles few, small, fugaceous. *Sepals* and *petals* greenish, rotund, minutely adpressed-sericeous externally, coriaceous, the edges thin and glabrous; the petals much the larger, spreading. *Stamens* very numerous; anthers narrowly oblong, about a fifth of the length of the slender slightly flattened filaments. *Ovary* narrowly ovoid, vertically ridged, minutely adpressed-sericeous. *Style* longer than the ovary, vertically ridged and sericeous like the ovary. *Stigma* with 5 small roundish lobes. *Fruit* unknown.

Perak, at elevations of 500 to 1000 feet, King's Collector.

3. *GORDONIA MAINGAYI*, Dyer in Hook. fl. Fl. Br. Ind. I, 291. A tree 30 to 40 feet high: young branches slender, with glabrous pale roughish bark, pubescent towards the apices. *Leaves* coriaceous, broadly oblanceolate, shortly and bluntly acuminate, obscurely serrulate in the upper two-thirds, the lower third gradually attenuate, entire: both surfaces glabrous, the upper greenish, the lower brownish when dry, the midrib bold and sparsely pubescent beneath; lateral nerves 6 pairs, indistinct; length 2·5 to 3 in., breadth 1 to 1·4 in., petiole ·25 in. *Flowers* sub-sessile, ·8 to 1 in. in diam., buds sub-globular; bracts, sepals and petals forming a cone, all adpressed-sericeous externally except the glabrous edges: pedicels about ·15 in. long. *Sepals* and petals orbicular, blunt or retuse. *Stamens* numerous; anthers elongate-ovoid; filaments much longer, slender. *Ovary* ovoid-conic, vertically ridged, adpressed-sericeous, 4 or 5-celled. *Style* single, angled. *Stigmas* 4 or 5, acute, connivent. *Capsules* 4 to 5-angled, woody, 1 to 1·25 long, ·5 to ·6 in diam., 4 or 5-celled, backs of valves flat. *Seeds* ·9 in. long of which thr. fourths are wing.

Malacca; Maingay, No. 192. Perak, Scortechini, Wray; at about 1000 feet.

4. *GORDONIA SCORTECHINII*, King, n. sp. A tree; young branches slender, dark brown, glabrous, the apices and leaf-buds minutely puberulous. *Leaves* coriaceous, narrowly elliptic, blunt, or sub-emarginate, slightly narrowed to the sub-acute or rounded base; both surfaces glabrous, the lower dull, pale; the upper shining, green when dry; midrib bold; nerves about 8 pairs, faint on the upper, invisible on the lower surface; length 2 to 3 in., breadth ·8 to 1·4 in., petiole ·25 in. *Flowers* ·6 in. in diam., solitary, axillary, only towards the apices of the branches, on very short curved pubescent peduncles. Buds ovoid. *Sepals* orbicular, fleshy, unequal, pubescent externally. *Petals* twice as large as the sepals, membranous, puberulous externally. *Stamens* few, (only about 30); anthers broadly ovate, about a fourth as long as the flattened filaments. *Ovary* narrowly ovoid, pubescent, 3-celled. *Styles* 3, thick, shorter than the ovary, pubescent; stigmas on the inner surface only, slightly spreading. *Fruit* unknown.

Perak; Scortechini, No. 362b.

This has a superficial resemblance to *G. Maingayii*, to which the late Father Scortechini referred it. But it has smaller flowers with fewer stamens, and very different ovary and styles; the leaves moreover are thicker than those of *G. Maingayii*, and are not oblanceolate.

5. *GORDONIA IMBRICATA*, King, n. sp. A tree? Young branches rather stout, glabrous, dark purplish-brown when dry. *Leaves* coria-

ceous, oval-oblong, sometimes slightly oblanceolate, the apex obtuse, very slightly emarginate, the edges thickened and slightly recurved, quite entire or very faintly sub-serrulate; the base slightly narrowed, roundish; both surfaces shining, the upper greenish; the lower dull, tinged with brown when dry, midrib bold: nerves about 12 pairs, thick but inconspicuous; length 1.75 to 2.25 in., breadth .9 to 1.1 in.; petiole .15 in., thick. *Flowers* about 1 in. in diam., axillary, solitary, sub-sessile, only in the upper axils; the buds elongate-obovoid; the bracts numerous, closely imbricate, passing into the sepals, all orbicular, and pubescent externally with broad scarious glabrous edges. *Petals* much larger than the sepals, orbicular, densely and minutely pubescent externally, fleshy with thin glabrous edges. *Stamens* numerous; anthers ovate, about one-fourth of the length of the slender cylindric filaments. *Ovary* ovoid-conic, ridged, adpressed-pubescent, 5-celled. *Style* single, boldly 5-ridged; stigmas distinct, small. *Fruit* slightly under 1 in. long, .4 in. in diam., 5-angled, adpressed-pubescent, subtended by the elongate imbricate cup formed by the sepals and bracts. *Seeds* .75 in. in length, of which one half is wing.

Perak. Scortechini, No. 402b.

Father Scortechini's scanty specimens are accompanied by no notes; but, from the species of *Hymenophyllum* growing on the branches of some of them, I conclude that they were collected probably at elevations of 4000 or 5000 feet. The remarkable imbricate buds at once distinguish this species.

6. *GORDONIA MULTINERVIS*, King, n. sp. A tree 40 to 50 feet high; young branches smooth, greenish, sub-compressed, all parts glabrous except the flowers. *Leaves* thinly coriaceous, obovate, apex rounded or mucronate, faintly crenate-serrate or subentire, attenuate below the middle and passing into the short petiole; upper surface greenish when dry, the lower brown, midrib bold; main nerves 12 to 18 pairs, spreading, rather faint, interarching .2 in. from the edge, length 5.5 to 8 in., breadth 2.5 to 3.25 in.; petiole .2 to .25 in., stout. *Flowers* 1.25 in. in diam., on stout curved peduncles .5 to .6 in. long; bracts small, few, fugaceous. *Sepals* rotund, fleshy, spreading, adpressed-sericeous externally, the edges glabrous. *Petals* like the sepals but larger and thinner, spreading. *Anthers* short, broadly ovate, only a quarter of the length of the slender slightly flattened filaments. *Ovary* ovoid-conic, adpressed-sericeous, 5-celled. *Style* single, thick, sub-glabrous. *Stigma* discoid, with 5 blunt lobes. *Fruit* unknown.

Perak; Scortechini, No. 1968.

The style and stigmas are quite those of a *Gordonia*. The leaves, however, are more those of a *Pyrenaria* and are very like those of the Burmese *P. attenuata*, Seem.

10. ARCHYTÆA, Martius.

Glabrous shrubs or trees with semialexicaul leaves. *Flowers* on a lateral, compressed, 1 to 4-flowered, peduncle. *Bracts* large, leaf-like. *Sepals* and *petals* each 5. *Stamens* numerous, 5-adelphous; anthers versatile. *Ovary* 5-celled; styles distinct, or wholly united; ovules numerous, in many imbricating rows. *Capsule* acuminate, septicidal from below, with a persistent axis. *Seeds* linear-subcylindric, albumen scanty. Distrib. Trop. Amer. and Indian Archipelago. Species 3.

1. ARCHYTÆA VAHLII, Choisy Mem. Ternstr. 73. A glabrous shrub (sometimes epiphytic) or small tree: the young branches, pale, smooth. *Leaves* thinly coriaceous, sessile, narrowly oblanceolate, acute, entire, slightly narrowed to the truncate or slightly amplexicaul base; nerves about 15 pairs, straight, erect, interarching with an intra-marginal nerve; length 3 to 4·5 in., breadth ·5 to ·75 in. *Flowers* 1 to 1·25 in. in diam.; peduncles crowded towards the end of the branches, coloured; bracts close to the flowers, oblong, sub-serrulate, ·5 to ·75 in. long. *Sepals* ovate-rotund, coriaceous. *Petals* obovate, much larger than the sepals, membranous, veined, pink. *Fruit* ·75 in. long, narrowly ovoid, acuminate, crowned by the persistent styles. Hook. fil. Fl. Br. Ind. i, 294. Pierre Fl. For. Coch.-Chine, t. 129. *Ploiarium elegans*, Korth. Verh. Nat. Gesch. Bot. 135, t. 25. Miq. Fl. Ind. Bat. I, Pt. ii, 491. *Hypericum alternifolium*, Vahl. Symb. ii, t. 42; DC. Prodr. i, 445; Wall. Cat. 4806.

In all the provinces except the Andaman and Nicobar Islands. Distrib. The Malayan Archipelago.

** Note on the fruit of *Xanthophyllum Scortechinii*, King.

Since the pages describing the genus *Xanthophyllum* were printed off, I have received from Mr. Curtis, of the Forest Department, Penang, complete specimens of this species; and I am therefore now able to add to the account of it given on p. 140 the following description of the young fruit.

Fruit globular or ovoid-globular, ·75 to 1 in. in diam., shortly apiculate, smooth, shining; the pericarp very thick.

Ripe fruit is still a desideratum.

